Practice: 101 - CNMP Design and Implementation Activity

Scenario: #5 - Design-CNMP Revision

Scenario Description:

A Comprehensive Nutrient Management Plan (CNMP) will be revised to address changes in manure management, volume or analysis, plants and crops, or plant and crop management or to adjust the nutrient balance on an Animal Feeding Operation (AFO). No modifications are required to engineered practices in the farmstead/production area. This scenario is where the services of a professional engineer are typically not required. The producer may export manure or organic products from the farm. The producer has an animal production area and land applies nutrients.

Before Situation:

The owner/operator of an AFO has an existing written Comprehensive Nutrient Management Plan (CNMP) that addresses the current required resource concerns and client objectives present on the facility production area and land application areas. The CNMP is out of date or does not meet current needs or objectives. Various levels of management and conservation implementation have changed on the operation. Soil tests, manure analyses, or changes in cropping system require that the nutrient balance be adjusted to bring the CNMP up to date.

After Situation:

Utilize a certified Technical Service Provider (TSP) to design planned conservation practices that address the handling, storage, and application of animal waste in an environmentally safe manner. Design and implementation will meet the general and additional applicable criteria found in each conservation practice. Design all conservation practices found in Comprehensive Nutrient Management Plan (CPA 102)or Conservation Plan that addresses the planned practices for land application of manure and nutrients, and the handling, transfer, storage and treatment of animal wastes. Management and conservation practices in the CNMP document delivered to the client ensure that, if implemented, the AFO will properly, within applicable NRCS standards and specifications, store, handle, and contain manure and wastewater materials generated by the AFO; dispose of AFO mortality; implement conservation practices to reduce soil erosion on land application areas to sustainable levels; land apply waste material nutrients in a manner than meets NRCS 590 Nutrient Management standard technical criteria.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $4,874.00

Scenario Cost/Unit: $4,874.00

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$108.51	40	$4,340.40
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	5	$533.60

Practice: 101 - CNMP Design and Implementation Activity

Scenario: #21 - Design- Livestock Operations greater than 300 AU without Land Application and Minimal Engineering

Scenario Description:

Animal Feeding Operation (AFO) currently greater than 300 animal units (AU). The producer exports (material transferred to another owner with written documentation of the transfer) manure or organic products from the farm. The operation has an animal production area, cropland, and applies most nutrients (manure and commercial fertilizers). No State requirement for Professional Engineer.

Before Situation:

Currently the production area and land application areas do not meet NRCS quality criteria for water quality and soil erosion. Soil tests are not current. Manure not frequently tested. Various levels of management and conservation implementation have occurred on the farm. Little documentation of the systems used and practices installed exists. The producer may or may not have a conservation plan or a nutrient management plan. Partial implementation of CNMP-related practices for the AFO has potentially occurred.

After Situation:

Utilize a certified Technical Service Provider (TSP) to design planned conservation practices that address the handling, storage, and application of animal waste in an environmentally safe manner. Design and implementation will meet the general and additional applicable criteria found in each conservation practice. Design all conservation practices found in Comprehensive Nutrient Management Plan (CPA 102)or Conservation Plan that addresses the planned practices for land application of manure and nutrients, and the handling, transfer, storage and treatment of animal wastes. Management and conservation practices in the CNMP document delivered to the client ensure that, if implemented, the AFO will properly, within applicable NRCS standards and specifications, store, handle, and contain manure and wastewater materials generated by the AFO; dispose of AFO mortality; implement conservation practices to reduce soil erosion on land application areas to sustainable levels; land apply waste material nutrients in a manner than meets NRCS 590 Nutrient Management standard technical criteria.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $4,973.56

Scenario Cost/Unit: $4,973.56

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$108.51	36	$3,906.36
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	10	$1,067.20

Practice: 101 - CNMP Design and Implementation Activity

Scenario: #37 - Design- Dairy less than 300 AU Land Application

Scenario Description:

Dairy Animal Feeding Operation (AFO) currently less than 300 animal units (AU) land application. The producer may export (material transferred to another owner with written documentation of the transfer) modest amounts of the manure or organic products from the farm. The operation has an animal production area, cropland, and applies most nutrients (manure and commercial fertilizers).

Before Situation:

Currently the production area and land application areas do not meet NRCS quality criteria for water quality and soil erosion. Soil tests are not current. Manure not frequently tested.

After Situation:

Utilize a certified Technical Service Provider (TSP) to design planned conservation practices that address the handling, storage, and application of animal waste in an environmentally safe manner. Design and implementation will meet the general and additonal applicable criteria found in each conservation practice. Job sheets and implementation requirement documents found in State's eFOTG Section IV Conservation practices may be used. Design all conservation practices found in Comprehensive Nutrient Management Plan (CPA 102) or Conservation Plan that address the planned practices for land application of manure and nutrients, and the handling, transfer, storage and treatment of animal wastes.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $10,779.40

Scenario Cost/Unit: $10,779.40

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$108.51	60	$6,510.60
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	40	$4,268.80

Practice: 101 - CNMP Design and Implementation Activity

Scenario: #53 - Design- Dairy greater than 300 AU and less than 700 AU with Land Application

Scenario Description:

Dairy Animal Feeding Operation (AFO) currently greater than 300 animal units (AU) and less than 700 AU with land application. The producer may export (material transferred to another owner with written documentation of the transfer) modest amounts of the manure or organic products from the farm. The operation has an animal production area, cropland, and applies most nutrients (manure and commercial fertilizers).

Before Situation:

Currently the production area and land application areas do not meet NRCS quality criteria for water quality and soil erosion. Soil tests are not current. Manure not frequently tested.

After Situation:

Utilize a certified Technical Service Provider (TSP) to design planned conservation practices that address the handling, storage, and application of animal waste in an environmentally safe manner. Design and implementation will meet the general and additonal applicable criteria found in each conservation practice. Job sheets and implementation requirement documents found in State's eFOTG Section IV Conservation practices may be used. Design all conservation practices found in Comprehensive Nutrient Management Plan (CPA 102) or Conservation Plan that address the planned practices for land application of manure and nutrients, and the handling, transfer, storage and treatment of animal wastes.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $11,430.46

Scenario Cost/Unit: $11,430.46

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$108.51	66	$7,161.66
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	40	$4,268.80

Practice: 101 - CNMP Design and Implementation Activity

Scenario: #69 - Design- Non Dairy Operation greater than 300 AU and less than 700 AU with Land Application

Scenario Description:

Animal Feeding Operation (AFO) currently greater than 300 animal units (AU) and less than 700 AU with land application. The producer may export (material transferred to another owner with written documentation of the transfer) modest amounts of the manure or organic products from the farm. The operation has an animal production area, cropland, and applies most nutrients (manure and commercial fertilizers).

Before Situation:

Currently the production area and land application areas do not meet NRCS quality criteria for water quality and soil erosion. Soil tests are not current. Manure not frequently tested.

After Situation:

Utilize a certified Technical Service Provider (TSP) to design planned conservation practices that address the handling, storage, and application of animal waste in an environmentally safe manner. Design and implementation will meet the general and additonal applicable criteria found in each conservation practice. Job sheets and implementation requirement documents found in State's eFOTG Section IV Conservation practices may be used. Design all conservation practices found in Comprehensive Nutrient Management Plan (CPA 102) or Conservation Plan that address the planned practices for land application of manure and nutrients, and the handling, transfer, storage and treatment of animal wastes.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $10,786.56

Scenario Cost/Unit: $10,786.56

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$108.51	64	$6,944.64
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	36	$3,841.92

Practice: 101 - CNMP Design and Implementation Activity

Scenario: #85 - Design- Non Dairy Operation Less than 300 AU with Land Application

Scenario Description:

Animal Feeding Operation (AFO) currently less than 300 animal units (AU) with land application. The producer may export (material transferred to another owner with written documentation of the transfer) modest amounts of the manure or organic products from the farm. The operation has an animal production area, cropland, and applies most nutrients (manure and commercial fertilizers).

Before Situation:

Currently the production area and land application areas do not meet NRCS quality criteria for water quality and soil erosion. Soil tests are not current. Manure not frequently tested.

After Situation:

Utilize a certified Technical Service Provider (TSP) to design planned conservation practices that address the handling, storage, and application of animal waste in an environmentally safe manner. Design and implementation will meet the general and additonal applicable criteria found in each conservation practice. Job sheets and implementation requirement documents found in State's eFOTG Section IV Conservation practices may be used. Design all conservation practices found in Comprehensive Nutrient Management Plan (CPA 102) or Conservation Plan that address the planned practices for land application of manure and nutrients, and the handling, transfer, storage and treatment of animal wastes.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $9,609.06

Scenario Cost/Unit: $9,609.06

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$108.51	62	$6,727.62
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	27	$2,881.44

Practice: 101 - CNMP Design and Implementation Activity

Scenario: #101 - Design- Non Dairy Operation greater 700 AU with Land Application

Scenario Description:

Animal Feeding Operation (AFO) currently greater than 700 animal units (AU) with land application. The producer may export (material transferred to another owner with written documentation of the transfer) modest amounts of the manure or organic products from the farm. The operation has an animal production area, cropland, and applies most nutrients (manure and commercial fertilizers).

Before Situation:

Currently the production area and land application areas do not meet NRCS quality criteria for water quality and soil erosion. Soil tests are not current. Manure not frequently tested.

After Situation:

Utilize a certified Technical Service Provider (TSP) to design planned conservation practices that address the handling, storage, and application of animal waste in an environmentally safe manner. Design and implementation will meet the general and additonal applicable criteria found in each conservation practice. Job sheets and implementation requirement documents found in State's eFOTG Section IV Conservation practices may be used. Design all conservation practices found in Comprehensive Nutrient Management Plan (CPA 102) or Conservation Plan that address the planned practices for land application of manure and nutrients, and the handling, transfer, storage and treatment of animal wastes.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $12,942.44

Scenario Cost/Unit: $12,942.44

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$108.51	76	$8,246.76
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	44	$4,695.68

Practice: 101 - CNMP Design and Implementation Activity

Scenario: #117 - Design- Small Livestock Operations less than 300 AU without Land Application

Scenario Description:

Animal Feeding Operation (AFO) currently less than 300 animal units (AU). The producer exports (material transferred to another owner with written documentation of the transfer) the manure or organic products from the farm. The operation has an animal production area, cropland, and applies most nutrients (manure and commercial fertilizers).

Before Situation:

Currently the production area and land application areas do not meet NRCS quality criteria for water quality and soil erosion. Soil tests are not current. Manure not frequently tested. Various levels of management and conservation implementation have occurred on the farm. Little documentation of the systems used and practices installed exists. The producer may or may not have a conservation plan or a nutrient management plan. Partial implementation of CNMP-related practices for the AFO has potentially occurred.

After Situation:

Utilize a certified Technical Service Provider (TSP) to design planned conservation practices that address the handling, storage, and application of animal waste in an environmentally safe manner. Design and implementation will meet the general and additonal applicable criteria found in each conservation practice. Design all conservation practices found in Comprehensive Nutrient Management Plan (CPA 102)or Conservation Plan that addresses the planned practices for land application of manure and nutrients, and the handling, transfer, storage and treatment of animal wastes. Management and conservation practices in the CNMP document delivered to the client ensure that, if implemented, the AFO will properly, within applicable NRCS standards and specifications, store, handle, and contain manure and wastewater materials generated by the AFO; dispose of AFO mortality; implement conservation practices to reduce soil erosion on land application areas to sustainable levels; land apply waste materialnutrients in a manner than meets NRCS 590 Nutrient Management standard technical criteria.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $6,988.71

Scenario Cost/Unit: $6,988.71

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$108.51	29	$3,146.79
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	36	$3,841.92

Practice: 101 - CNMP Design and Implementation Activity

Scenario: #133 - Design- Livestock Operations greater than 300 AU without Land Application

Scenario Description:

Animal Feeding Operation (AFO) currently greater than 300 animal units (AU). The producer exports (material transferred to another owner with written documentation of the transfer) manure or organic products from the farm. The operation has an animal production area, cropland, and applies most nutrients (manure and commercial fertilizers).

Before Situation:

Currently the production area and land application areas do not meet NRCS quality criteria for water quality and soil erosion. Soil tests are not current. Manure not frequently tested. Various levels of management and conservation implementation have occurred on the farm. Little documentation of the systems used and practices installed exists. The producer may or may not have a conservation plan or a nutrient management plan. Partial implementation of CNMP-related practices for the AFO has potentially occurred.

After Situation:

Utilize a certified Technical Service Provider (TSP) to design planned conservation practices that address the handling, storage, and application of animal waste in an environmentally safe manner. Design and implementation will meet the general and additional applicable criteria found in each conservation practice. Design all conservation practices found in Comprehensive Nutrient Management Plan (CPA 102)or Conservation Plan that addresses the planned practices for land application of manure and nutrients, and the handling, transfer, storage and treatment of animal wastes. Management and conservation practices in the CNMP document delivered to the client ensure that, if implemented, the AFO will properly, within applicable NRCS standards and specifications, store, handle, and contain manure and wastewater materials generated by the AFO; dispose of AFO mortality; implement conservation practices to reduce soil erosion on land application areas to sustainable levels; land apply waste material nutrients in a manner than meets NRCS 590 Nutrient Management standard technical criteria.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $7,623.66

Scenario Cost/Unit: $7,623.66

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$108.51	26	$2,821.26
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	45	$4,802.40

Practice: 101 - CNMP Design and Implementation Activity

Scenario: #149 - Design- Small Livestock Operations greater than 300 AU with Land Application and Minimal Engineering

Scenario Description:

Animal Feeding Operation (AFO) currently greater than 300 animal units (AU) with land application and minimal engineering. The producer exports (material transferred to another owner with written documentation of the transfer) modest amounts of manure or organic products from the farm. The operation has an animal production area, cropland, and applies most nutrients (manure and commercial fertilizers). State laws do not require a PE.

Before Situation:

Currently the production area and land application areas do not meet NRCS quality criteria for water quality and soil erosion. Soil tests are not current. Manure not frequently tested. Various levels of management and conservation implementation have occurred on the farm. Little documentation of the systems used and practices installed exists. The producer may or may not have a conservation plan or a nutrient management plan. Partial implementation of CNMP-related practices for the AFO has potentially occurred.

After Situation:

Utilize a certified Technical Service Provider (TSP) to design planned conservation practices that address the handling, storage, and application of animal waste in an environmentally safe manner. Design and implementation will meet the general and additonal applicable criteria found in each conservation practice. Design all conservation practices found in Comprehensive Nutrient Management Plan (CPA 102)or Conservation Plan that addresses the planned practices for land application of manure and nutrients, and the handling, transfer, storage and treatment of animal wastes. Management and conservation practices in the CNMP document delivered to the client ensure that, if implemented, the AFO will properly, within applicable NRCS standards and specifications, store, handle, and contain manure and wastewater materials generated by the AFO; dispose of AFO mortality; implement conservation practices to reduce soil erosion on land application areas to sustainable levels; land apply waste material nutrients in a manner than meets NRCS 590 Nutrient Management standard technical criteria.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $8,776.78

Scenario Cost/Unit: $8,776.78

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$108.51	74	$8,029.74
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	7	$747.04

Practice: 101 - CNMP Design and Implementation Activity

Scenario: #165 - Design- Small Livestock Operations less than 300 AU with Land Application and Minimal Engineering

Scenario Description:

Animal Feeding Operation (AFO) currently less than 300 animal units (AU) with land application and minimal engineering. The producer exports (material transferred to another owner with written documentation of the transfer) modest amounts of manure or organic products from the farm. The operation has an animal production area, cropland, and applies most nutrients (manure and commercial fertilizers). State laws do not require a PE.

Before Situation:

Currently the production area and land application areas do not meet NRCS quality criteria for water quality and soil erosion. Soil tests are not current. Manure not frequently tested. Various levels of management and conservation implementation have occurred on the farm. Little documentation of the systems used and practices installed exists. The producer may or may not have a conservation plan or a nutrient management plan. Partial implementation of CNMP-related practices for the AFO has potentially occurred.

After Situation:

Utilize a certified Technical Service Provider (TSP) to design planned conservation practices that address the handling, storage, and application of animal waste in an environmentally safe manner. Design and implementation will meet the general and additonal applicable criteria found in each conservation practice. Design all conservation practices found in Comprehensive Nutrient Management Plan (CPA 102)or Conservation Plan that addresses the planned practices for land application of manure and nutrients, and the handling, transfer, storage and treatment of animal wastes. Management and conservation practices in the CNMP document delivered to the client ensure that, if implemented, the AFO will properly, within applicable NRCS standards and specifications, store, handle, and contain manure and wastewater materials generated by the AFO; dispose of AFO mortality; implement conservation practices to reduce soil erosion on land application areas to sustainable levels; land apply waste material nutrients in a manner than meets NRCS 590 Nutrient Management standard technical criteria.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $6,926.74

Scenario Cost/Unit: $6,926.74

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$108.51	54	$5,859.54
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	10	$1,067.20

Practice: 101 - CNMP Design and Implementation Activity

Scenario: #181 - Design- Livestock Operations less than or equal to 300 AU without Land Application and Minimal Engineering

Scenario Description:

Animal Feeding Operation (AFO) currently less than or equal to 300 animal units (AU) with land application and minimal engineering. The producer exports (material transferred to another owner with written documentation of the transfer) modest amount of manure or organic products from the farm. The operation has an animal production area, cropland, and applies most nutrients (manure and commercial fertilizers). No State requirement for Professional Engineer.

Before Situation:

Currently the production area and land application areas do not meet NRCS quality criteria for water quality and soil erosion. Soil tests are not current. Manure not frequently tested. Various levels of management and conservation implementation have occurred on the farm. Little documentation of the systems used and practices installed exists. The producer may or may not have a conservation plan or a nutrient management plan. Partial implementation of CNMP-related practices for the AFO has potentially occurred.

After Situation:

Utilize a certified Technical Service Provider (TSP) to design planned conservation practices that address the handling, storage, and application of animal waste in an environmentally safe manner. Design and implementation will meet the general and additonal applicable criteria found in each conservation practice. Design all conservation practices found in Comprehensive Nutrient Management Plan (CPA 102)or Conservation Plan that addresses the planned practices for land application of manure and nutrients, and the handling, transfer, storage and treatment of animal wastes. Management and conservation practices in the CNMP document delivered to the client ensure that, if implemented, the AFO will properly, within applicable NRCS standards and specifications, store, handle, and contain manure and wastewater materials generated by the AFO; dispose of AFO mortality; implement conservation practices to reduce soil erosion on land application areas to sustainable levels; land apply waste material nutrients in a manner than meets NRCS 590 Nutrient Management standard technical criteria.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $6,709.72

Scenario Cost/Unit: $6,709.72

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$108.51	52	$5,642.52
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	10	$1,067.20

Practice: 101 - CNMP Design and Implementation Activity

Scenario: #197 - Design- Dairy greater than or equal to 700 AU with Land Application

Scenario Description:

Dairy Animal Feeding Operation (AFO) currently greater than or equal to 700 animal units (AU) with land application. The producer may export (material transferred to another owner with written documentation of the transfer) modest amounts of the manure or organic products from the farm. The operation has an animal production area, cropland, and applies most nutrients (manure and commercial fertilizers).

Before Situation:

Currently the production area and land application areas do not meet NRCS quality criteria for water quality and soil erosion. Soil tests are not current. Manure not frequently tested.

After Situation:

Utilize a certified Technical Service Provider (TSP) to design planned conservation practices that address the handling, storage, and application of animal waste in an environmentally safe manner. Design and implementation will meet the general and additonal applicable criteria found in each conservation practice. Job sheets and implementation requirement documents found in State's eFOTG Section IV Conservation practices may be used. Design all conservation practices found in Comprehensive Nutrient Management Plan (CPA 102) or Conservation Plan that address the planned practices for land application of manure and nutrients, and the handling, transfer, storage and treatment of animal wastes.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $12,729.00

Scenario Cost/Unit: $12,729.00

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$108.51	76	$8,246.76
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	42	$4,482.24

Practice: 102 - Comprehensive Nutrient Management Plan

Scenario: #351 - Planning Dairy Greater than 300 AU, less than 700 AU with Land

Scenario Description:

Dairy Animal Feeding Operation (AFO) greater than 300 but less than 700 animal units (AU) animal units (AU). The producer utilizes manure or organic products from the farm or may export. The operation has an animal production area, cropland, and applies most nutrients (manure and commercial fertilizers).

Before Situation:

Currently the production area and land application areas do not meet NRCS quality criteria for water quality and soil erosion. Soil tests are not current or do not exist. Manure or Organic products are not frequently tested. The production area and land application areas do not meet NRCS quality criteria for water quality and soil erosion. The owner/operator of a Dairy AFO has not received a written Comprehensive Nutrient Management Plan (CNMP) that addresses all resource concerns present on the facility production area and land waste application areas. Various levels of management and conservation implementation have occurred on the farm. Little documentation of the systems used and practices installed exists. The producer may or may not have a conservation plan or a nutrient management plan. Resource concerns on the AFO production area and land application areas remain to be addressed through the development of a complete CPA-CNMP.

After Situation:

Utilize a CNMP certified Technical Service Provider (TSP) to plan conservation practices that address the handling, storage, and application of animal waste in an environmentally safe manner. CPA-CNMP describes the conservation practice solutions to all identified resource concerns on the AFO production area and land application areas. Collection, transfer, and storage of manure and wastewater systems, mortality management facilities, as well as any rainfall or runoff diversion systems will be inventoried-evaluated and planned for adequacy according to applicable NRCS conservation practice standard technical criteria. Decisions presented within the CNMP have been made to mitigate, if feasible, negative air quality impacts and improve farmland safety and security.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $9,627.00

Scenario Cost/Unit: $9,627.00

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	50	$5,336.00
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$85.82	50	$4,291.00

Practice: 102 - Comprehensive Nutrient Management Plan

Scenario: #367 - Planning Dairy Less than 300 AU with Land

Scenario Description:

Dairy Animal Feeding Operation (AFO) currently is less than 300 animal units (AU). The producer utilizes manure or organic products from the farm or may export. The operation has an animal production area, cropland, and applies most nutrients (manure and commercial fertilizers).

Before Situation:

Currently the production area and land application areas do not meet NRCS quality criteria for water quality and soil erosion. Soil tests are not current or do not exist. Manure or Organic products are not frequently tested. The production area and land application areas do not meet NRCS quality criteria for water quality and soil erosion. The owner/operator of a Dairy AFO has not received a written Comprehensive Nutrient Management Plan (CNMP) that addresses all resource concerns present on the facility production area and land waste application areas. Various levels of management and conservation implementation have occurred on the farm. Little documentation of the systems used and practices installed exists. The producer may or may not have a conservation plan or a nutrient management plan. Resource concerns on the AFO production area and land application areas remain to be addressed through the development of a complete CPA-CNMP.

After Situation:

Utilize a CNMP Certified Technical Service Provider (TSP) to plan conservation practices that address the handling, storage, and application of animal waste in an environmentally safe manner. CPA-CNMP describes the conservation practice solutions to all identified resource concerns on the AFO production area and land application areas. Collection, transfer, and storage of manure and wastewater systems, mortality management facilities, as well as any rainfall or runoff diversion systems will be inventoried-evaluated and planned for adequacy according to applicable NRCS conservation practice standard technical criteria. Decisions presented within the CNMP have been made to mitigate, if feasible, negative air quality impacts and improve farmland safety and security.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $8,130.70

Scenario Cost/Unit: $8,130.70

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	40	$4,268.80
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$85.82	45	$3,861.90

Practice: 102 - Comprehensive Nutrient Management Plan

Scenario: #383 - Planning Livestock Greater than 300 AU, No-Land

Scenario Description:

Animal Feeding Operation (AFO) currently greater than 300 animal units (AU). The producer exports (material transferred to another owner with written documentation of the transfer) all manure or organic products from the farm. The operation has an animal production area only.

Before Situation:

Currently the production area does not meet NRCS quality criteria for water quality. Manure or Organic products are not frequently tested. The production area does not meet NRCS quality criteria for water quality and soil erosion. The owner/operator of a livestock AFO has not received a written Comprehensive Nutrient Management Plan (CNMP) that addresses all resource concerns present on the facility production area. Various levels of management and conservation implementation have occurred on the farm. Little documentation of the systems used and practices installed exists. The producer may or may not have a conservation plan or a nutrient management plan. Resource concerns on the AFO production area remain to be addressed through the development of a complete CPA-CNMP.

After Situation:

Utilize a CNMP certified Technical Service Provider (TSP) to plan conservation practices that address the handling, storage, and transfer of animal waste in an environmentally safe manner. CPA-CNMP describes the conservation practice solutions to all identified resource concerns on the AFO production area. Collection, transfer, and storage of manure and wastewater systems, mortality management facilities, as well as any rainfall or runoff diversion systems will be inventoried-evaluated and planned for adequacy according to applicable NRCS conservation practice standard technical criteria. Decisions presented within the CNMP have been made to mitigate, if feasible, negative air quality impacts and improve farmland safety and security.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $7,168.00

Scenario Cost/Unit: $7,168.00

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	35	$3,735.20
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$85.82	40	$3,432.80

Practice: 102 - Comprehensive Nutrient Management Plan

Scenario: #399 - Planning Livestock Less than 300 AU, No-Land

Scenario Description:

Animal Feeding Operation (AFO) currently less than 300 animal units (AU). The producer exports (material transferred to another owner with written documentation of the transfer) all manure or organic products from the farm. The operation has an animal production area only.

Before Situation:

Currently the production area does not meet NRCS quality criteria for water quality. Manure or Organic products are not frequently tested. The production area does not meet NRCS quality criteria for water quality and soil erosion. The owner/operator of a livestock AFO has not received a written Comprehensive Nutrient Management Plan (CNMP) that addresses all resource concerns present on the facility production area. Various levels of management and conservation implementation have occurred on the farm. Little documentation of the systems used and practices installed exists. The producer may or may not have a conservation plan or a nutrient management plan. Resource concerns on the AFO production area remain to be addressed through the development of a complete CPA-CNMP.

After Situation:

Utilize a CNMP certified Technical Service Provider (TSP) to plan conservation practices that address the handling, storage, and transfer of animal waste in an environmentally safe manner. CPA-CNMP describes the conservation practice solutions to all identified resource concerns on the AFO production area. Collection, transfer, and storage of manure and wastewater systems, mortality management facilities, as well as any rainfall or runoff diversion systems will be inventoried-evaluated and planned for adequacy according to applicable NRCS conservation practice standard technical criteria. Decisions presented within the CNMP have been made to mitigate, if feasible, negative air quality impacts and improve farmland safety and security.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $5,242.60

Scenario Cost/Unit: $5,242.60

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	25	$2,668.00
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$85.82	30	$2,574.60

Practice: 102 - Comprehensive Nutrient Management Plan

Scenario: #415 - Planning Livestock Greater than 700 AU with Land

Scenario Description:
Animal Feeding Operation (AFO) currently is greater than 700 animal units (AU). The producer utilizes manure or organic products from the farm or may export. The operation has an animal production area, cropland, and applies most nutrients (manure and commercial fertilizers).

Before Situation:
Currently the production area and land application areas do not meet NRCS quality criteria for water quality and soil erosion. Soil tests are not current or do not exist. Manure or Organic products are not frequently tested. The production area and land application areas do not meet NRCS quality criteria for water quality and soil erosion. The owner/operator of a livestock AFO has not received a written Comprehensive Nutrient Management Plan (CNMP) that addresses all resource concerns present on the facility production area and land waste application areas. Various levels of management and conservation implementation have occurred on the farm. Little documentation of the systems used and practices installed exists. The producer may or may not have a conservation plan or a nutrient management plan. Resource concerns on the AFO production area and land waste application areas remain to be addressed through the development of a complete CPA-CNMP.

After Situation:
Utilize a CNMP Certified Technical Service Provider (TSP) to plan conservation practices that address the handling, storage, and application of animal waste in an environmentally safe manner. CPA-CNMP describes the conservation practice solutions to all identified resource concerns on the AFO production area and land application areas. Collection, transfer, and storage of manure and wastewater systems, mortality management facilities, as well as any rainfall or runoff diversion systems will be inventoried-evaluated and planned for adequacy according to applicable NRCS conservation practice standard technical criteria. Decisions presented within the CNMP have been made to mitigate, if feasible, negative air quality impacts and improve farmland safety and security.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $10,914.30

Scenario Cost/Unit: $10,914.30

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	50	$5,336.00
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$85.82	65	$5,578.30

Practice: 102 - Comprehensive Nutrient Management Plan

Scenario: #431 - Planning Livestock Greater than 300 AU, less than 700 AU with Land

Scenario Description:

Animal Feeding Operation (AFO) currently is greater than 300 but less than 700 animal units (AU). The producer utilizes manure or organic products from the farm or may export. The operation has an animal production area, cropland, and applies most nutrients (manure and commercial fertilizers).

Before Situation:

Currently the production area and land application areas do not meet NRCS quality criteria for water quality and soil erosion. Soil tests are not current or do not exist. Manure or Organic products are not frequently tested. The production area and land application areas do not meet NRCS quality criteria for water quality and soil erosion. The owner/operator of a livestock AFO has not received a written Comprehensive Nutrient Management Plan (CNMP) that addresses all resource concerns present on the facility production area and land waste application areas. Various levels of management and conservation implementation have occurred on the farm. Little documentation of the systems used and practices installed exists. The producer may or may not have a conservation plan or a nutrient management plan. Resource concerns on the AFO production area and land waste application areas remain to be addressed through the development of a complete CPA-CNMP.

After Situation:

Utilize a CNMP Certified Technical Service Provider (TSP) to plan conservation practices that address the handling, storage, and application of animal waste in an environmentally safe manner. CPA-CNMP describes the conservation practice solutions to all identified resource concerns on the AFO production area and land application areas. Collection, transfer, and storage of manure and wastewater systems, mortality management facilities, as well as any rainfall or runoff diversion systems will be inventoried-evaluated and planned for adequacy according to applicable NRCS conservation practice standard technical criteria. Decisions presented within the CNMP have been made to mitigate, if feasible, negative air quality impacts and improve farmland safety and security.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $8,988.90

Scenario Cost/Unit: $8,988.90

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	40	$4,268.80
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$85.82	55	$4,720.10

Practice: 102 - Comprehensive Nutrient Management Plan

Scenario: #447 - Planning Livestock Less than 300 AU with Land

Scenario Description:

Animal Feeding Operation (AFO) currently is less than 300 animal units (AU). The producer utilizes manure or organic products from the farm or may export. The operation has an animal production area, cropland, and applies most nutrients (manure and commercial fertilizers).

Before Situation:

Currently the production area and land application areas do not meet NRCS quality criteria for water quality and soil erosion. Soil tests are not current or do not exist. Manure or Organic products are not frequently tested. The production area and land application areas do not meet NRCS quality criteria for water quality and soil erosion. The owner/operator of a livestock AFO has not received a written Comprehensive Nutrient Management Plan (CNMP) that addresses all resource concerns present on the facility production area and land waste application areas. Various levels of management and conservation implementation have occurred on the farm. Little documentation of the systems used and practices installed exists. The producer may or may not have a conservation plan or a nutrient management plan. Resource concerns on the AFO production area and land waste application areas remain to be addressed through the development of a complete CPA-CNMP.

After Situation:

Utilize a CNMP Certified Technical Service Provider (TSP) to plan conservation practices that address the handling, storage, and application of animal waste in an environmentally safe manner. CPA-CNMP identifies the conservation practice solutions to all identified resource concerns on the AFO production area and land application areas. Collection, transfer, and storage of manure and wastewater systems, mortality management facilities, as well as any rainfall or runoff diversion systems will be inventoried-evaluated and planned for adequacy according to applicable NRCS conservation practice standard technical criteria. Decisions presented within the CNMP have been made to mitigate, if feasible, negative air quality impacts and improve farmland safety and security.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $6,678.42

Scenario Cost/Unit: $6,678.42

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	28	$2,988.16
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$85.82	43	$3,690.26

Practice: 102 - Comprehensive Nutrient Management Plan

Scenario: #463 - Planning Dairy Greater than 700 AU with Land

Scenario Description:

Dairy Animal Feeding Operation (AFO) greater than 700 animal units (AU). The producer utilizes manure or organic products from the farm or may export. The operation has an animal production area, cropland, and applies most nutrients (manure and commercial fertilizers).

Before Situation:

Currently the production area and land application areas do not meet NRCS quality criteria for water quality and soil erosion. Soil tests are not current or do not exist. Manure or Organic products are not frequently tested. The production area and land application areas do not meet NRCS quality criteria for water quality and soil erosion. The owner/operator of a Dairy AFO has not received a written Comprehensive Nutrient Management Plan (CNMP) that addresses all resource concerns present on the facility production area and land waste application areas. Various levels of management and conservation implementation have occurred on the farm. Little documentation of the systems used and practices installed exists. The producer may or may not have a conservation plan or a nutrient management plan. Resource concerns on the AFO production area and land application areas remain to be addressed through the development of a complete CPA-CNMP.

After Situation:

Utilize a CNMP certified Technical Service Provider (TSP) to plan conservation practices that address the handling, storage, and application of animal waste in an environmentally safe manner. CPA-CNMP describes the conservation practice solutions to all identified resource concerns on the AFO production area and land application areas. Collection, transfer, and storage of manure and wastewater systems, mortality management facilities, as well as any rainfall or runoff diversion systems will be inventoried-evaluated and planned for adequacy according to applicable NRCS conservation practice standard technical criteria. Decisions presented within the CNMP have been made to mitigate, if feasible, negative air quality impacts and improve farmland safety and security.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $12,086.00

Scenario Cost/Unit: $12,086.00

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	65	$6,936.80
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$85.82	60	$5,149.20

Practice: 106 - Forest Management Plan

Scenario: #32 - FMP Less Than or Equal to 20 acres

Scenario Description:

Nonindustrial Private Forest Land typically unmanaged or limited management activities. Typical site is approximately 1 to 20 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

Before Situation:

The producer currently manages forested lands without an existing forest management plan, or with an outdated plan. Resource concerns exist which are not addressed by a management plan. A Forest Management Plan or Conservation Plan Activities (CPA), as defined by EQIP regulation, is needed to allow the producer to apply for financial assistance through EQIP or other programs to help implement needed conservation practices. Associated Practices: 472, 666, 654, 655,384, 394, 383, 379, 338, 381, 391, 791, 490, 612, 660, 311, 380, 314, 315.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Forest Management Conservation Plan Activities (CPA). The CPA criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Forest Management CPA is not considered a Forest Harvest Plan, but should complement the needs for harvest if desired by the land user. Additional CPA plan criteria is detailed in the Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $1,607.21

Scenario Cost/Unit: $1,607.21

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, forester	1302	Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage.	Hours	$84.59	19	$1,607.21

Practice: 106 - Forest Management Plan

Scenario: #33 - FMP 21 to 100 acres

Scenario Description:

Nonindustrial Private Forest Land typically unmanaged or limited management activities. Typical site is approximately 21 to 100 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

Before Situation:

The producer currently manages forested lands without an existing forest management plan, or with an outdated plan. Resource concerns exist which are not addressed by a management plan. A Forest Management Plan or Conservation Plan Activities (CPA), as defined by EQIP regulation, is needed to allow the producer to apply for financial assistance through EQIP or other programs to help implement needed conservation practices. Associated Practices: 472, 666, 654, 655,384, 394, 383, 379, 338, 381, 391, 791, 490, 612, 660, 311, 380, 314, 315.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Forest Management Conservation Plan Activities (CPA). The CPA criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Forest Management CPA is not considered a Forest Harvest Plan, but should complement the needs for harvest if desired by the land user. Additional CPA plan criteria is detailed in the Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $2,368.52

Scenario Cost/Unit: $2,368.52

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, forester	1302	Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage.	Hours	$84.59	28	$2,368.52

Practice: 106 - Forest Management Plan

Scenario: #34 - FMP 101 to 250 acres

Scenario Description:

Nonindustrial Private Forest Land typically unmanaged or limited management activities. Typical site is approximately 101 to 250 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

Before Situation:

The producer currently manages forested lands without an existing forest management plan, or with an outdated plan. Resource concerns exist which are not addressed by a management plan. A Forest Management Plan or Conservation Plan Activities (CPA), as defined by EQIP regulation, is needed to allow the producer to apply for financial assistance through EQIP or other programs to help implement needed conservation practices. Associated Practices: 472, 666, 654, 655,384, 394, 383, 379, 338, 381, 391, 791, 490, 612, 660, 311, 380, 314, 315.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Forest Management Conservation Plan Activities (CPA). The CPA criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Forest Management CPA is not considered a Forest Harvest Plan, but should complement the needs for harvest if desired by the land user. Additional CPA plan criteria is detailed in the Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $3,891.14

Scenario Cost/Unit: $3,891.14

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, forester	1302	Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage.	Hours	$84.59	46	$3,891.14

Practice: 106 - Forest Management Plan

Scenario: #35 - FMP Greater Than 1000 acres

Scenario Description:

Nonindustrial Private Forest Land typically unmanaged or limited management activities. Typical site is approximately 1001 acres or greater in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

Before Situation:

The producer currently manages forested lands without an existing forest management plan, or with an outdated plan. Resource concerns exist which are not addressed by a management plan. A Forest Management Plan or Conservation Plan Activities (CPA), as defined by EQIP regulation, is needed to allow the producer to apply for financial assistance through EQIP or other programs to help implement needed conservation practices. Associated Practices: 472, 666, 654, 655,384, 394, 383, 379, 338, 381, 391, 791, 490, 612, 660, 311, 380, 314, 315.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Forest Management Conservation Plan Activities (CPA). The CPA criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Forest Management CPA is not considered a Forest Harvest Plan, but should complement the needs for harvest if desired by the land user. Additional CPA plan criteria is detailed in the Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $9,135.72

Scenario Cost/Unit: $9,135.72

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, forester	1302	Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage.	Hours	$84.59	108	$9,135.72

Practice: 106 - Forest Management Plan

Scenario: #36 - FMP 251 to 500 acres

Scenario Description:

Nonindustrial Private Forest Land typically unmanaged or limited management activities. Typical site is approximately 251 to 500 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

Before Situation:

The producer currently manages forested lands without an existing forest management plan, or with an outdated plan. Resource concerns exist which are not addressed by a management plan. A Forest Management Plan or Conservation Plan Activities (CPA), as defined by EQIP regulation, is needed to allow the producer to apply for financial assistance through EQIP or other programs to help implement needed conservation practices. Associated Practices: 472, 666, 654, 655,384, 394, 383, 379, 338, 381, 391, 791, 490, 612, 660, 311, 380, 314, 315.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Forest Management Conservation Activity Plan (CPA). The CPA requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Forest Management CPA is not considered a Forest Harvest Plan, but should complement the needs for harvest if desired by the land user. Additional CPA plan requirements are detailed in the Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $5,752.12

Scenario Cost/Unit: $5,752.12

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, forester	1302	Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage.	Hours	$84.59	68	$5,752.12

Practice: 106 - Forest Management Plan

Scenario: #37 - FMP 501 to 1000 acres

Scenario Description:

Nonindustrial Private Forest Land typically unmanaged or limited management activities. Typical site is approximately 501 to 1000 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

Before Situation:

The producer currently manages forested lands without an existing forest management plan, or with an outdated plan. Resource concerns exist which are not addressed by a management plan. A Forest Management Plan or Conservation Plan Activities (CPA), as defined by EQIP regulation, is needed to allow the producer to apply for financial assistance through EQIP or other programs to help implement needed conservation practices. Associated Practices: 472, 666, 654, 655,384, 394, 383, 379, 338, 381, 391, 791, 490, 612, 660, 311, 380, 314, 315.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Forest Management Conservation Plan Activities (CPA). The CPA criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Forest Management CPA is not considered a Forest Harvest Plan, but should complement the needs for harvest if desired by the land user. Additional CPA plan criteria is detailed in the Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $7,020.97

Scenario Cost/Unit: $7,020.97

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, forester	1302	Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage.	Hours	$84.59	83	$7,020.97

Practice: 110 - Grazing Management Plan

Scenario: #71 - Conservation Plan for Grazed Lands 101 to 500 acres

Scenario Description:

Site specific conservation plan for grazed lands for an agricultural operation with 101 to 500 acres grazed land. Natural Resource Concern: Soil erosion, water quality, fish and wildlife, plant condition, and all other appropriate resource concerns.

Before Situation:

Producer has no plan or limited knowledge of management of livestock or other animals on grazed land resources. The producer currently manages animals without a plan to address identified natural resource concerns. Producer is interested in management of animals to maximize profit margins, reduce costs, improve or address wildlife opportunities, and for other environmental benefit. Producer is willing to collaborate with a certified TSP to develop a plan and idenify problems and opportunities, determine objectives, inventory resources, analyze resource data, formulate alternatives, evaluate alternatives, and make decisions to meet objectives.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Conservation Planning Activity (CPA) plan for grazing lands. The CPA requires the plan to meet the General Requirements (steps 1-7) of the planning process. Step 1- Identify Problems and Opportunities, Step 2- Determine Objectives, Step 3-Inventory Resources, Step 4-Analyze Resource Data, Step 5-Formulate Alternatives, Step 6-Evaluate Alternatives, and Step 7-Make Decisions (Select Preferrred Alternative).

Feature Measure: 1

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $3,136.20

Scenario Cost/Unit: $3,136.20

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, range conservation	1299	Conservation Activity Plan labor to study, plan the use and management of rangelands to maximize their use in a sustainable manner. Range managers may inventory soils, plants, and animals; develop resource management plans; identify monitoring methods and collect data using those methods to determine if resource management objectives are being met or if adjustments to management activities are needed. For example, they may help ranchers attain optimum livestock production by determining the number and kind of animals to graze, the grazing system to use, and the best season for grazing. Cost associated with this component includes overhead and benefits (market price).	Hours	$104.54	30	$3,136.20

Practice: 110 - Grazing Management Plan

Scenario: #87 - Conservation Plan for Grazed Lands <100 acres.

Scenario Description:
Site specific conservation plan for agricultural operation with less than 100 acres grazed land. The plan will address the following natural resource concerns: soil erosion, water quality, fish and wildlife, plant condition, and all other appropriate resource concerns.

Before Situation:
Producer has no plan or limited knowledge of management of livestock or other animals on grazed land resources. The producer currently manages animals without a plan to address identified natural resource concerns. Producer is interested in management of animals to maximize profit margins, reduce costs, improve or address wildlife opportunities, and for other environmental benefit. Producer is willing to collaborate with a certified TSP to develop a plan and identify problems and opportunities, determine objectives, inventory resources, analyze resource data, formulate alternatives, evaluate alternatives, and make decisions to meet objectives.

After Situation:
After EQIP contract approval, participant has obtained services from a certified TSP for development of the Conservation Planning Activity (CPA) plan for grazing lands. The CPA requires the plan to meet the General Requirements (steps 1-7) of the planning process. Step 1- Identify Problems and Opportunities, Step 2- Determine Objectives, Step 3-Inventory Resources, Step 4-Analyze Resource Data, Step 5-Formulate Alternatives, Step 6-Evaluate Alternatives, and Step 7-Make Decisions (Select Preferred Alternative). The plan may include recommendations for associated conservation practices which address other related resource concerns. The CPA meets the basic quality criteria for the CPA 110 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: 1

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $2,508.96

Scenario Cost/Unit: $2,508.96

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, range conservation	1299	Conservation Activity Plan labor to study, plan the use and management of rangelands to maximize their use in a sustainable manner. Range managers may inventory soils, plants, and animals; develop resource management plans; identify monitoring methods and collect data using those methods to determine if resource management objectives are being met or if adjustments to management activities are needed. For example, they may help ranchers attain optimum livestock production by determining the number and kind of animals to graze, the grazing system to use, and the best season for grazing. Cost associated with this component includes overhead and benefits (market price).	Hours	$104.54	24	$2,508.96

Practice: 110 - Grazing Management Plan

Scenario: #103 - Conservation Plan for Grazed Lands 501 to 1,500 acres

Scenario Description:

Site specific conservation plan for grazed lands for an agricultural operation with 501 to 1,500 acres of grazed land. The plan will address the following natural resource concerns: soil erosion, water quality, fish and wildlife, plant condition and all other appropriate resource concerns.

Before Situation:

Producer has no plan or limited knowledge of management of livestock or other animals on grazed land resources. The producer currently manages animals without a plan to address identified natural resource concerns. Producer is interested in management of animals to maximize profit margins, reduce costs, improve or address wildlife opportunities, and for other environmental benefit. Producer is willing to collaborate with a certified TSP to develop a plan and idenify problems and opportunities, determine objectives, inventory resources, analyze resource data, formulate alternatives, evaluate alternatives, and make decisions to meet objectives.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Conservation Planning Activity (CPA) plan for grazing lands. The CPA requires the plan to meet the General Requirements (steps 1-7) of the planning process. Step 1- Identify Problems and Opportunities, Step 2- Determine Objectives, Step 3-Inventory Resources, Step 4-Analyze Resource Data, Step 5-Formulate Alternatives, Step 6-Evaluate Alternatives, and Step 7-Make Decisions (Select Preferrred Alternative). The plan may include recommendations for associated conservation practices which address other related resource concerns. The CPA meets the basic quality criteria for the CPA 110 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: 1

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $3,763.44

Scenario Cost/Unit: $3,763.44

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, range conservation	1299	Conservation Activity Plan labor to study, plan the use and management of rangelands to maximize their use in a sustainable manner. Range managers may inventory soils, plants, and animals; develop resource management plans; identify monitoring methods and collect data using those methods to determine if resource management objectives are being met or if adjustments to management activities are needed. For example, they may help ranchers attain optimum livestock production by determining the number and kind of animals to graze, the grazing system to use, and the best season for grazing. Cost associated with this component includes overhead and benefits (market price).	Hours	$104.54	36	$3,763.44

Practice: 110 - Grazing Management Plan

Scenario: #119 - Conservation Plan for Grazed Lands 1,501 to 5,000 acres

Scenario Description:
Site specific conservation plan for grazed lands for an agricultural operation with 1,501 to 5,000 acres grazed land. The following natural resource concerns will be addressed: soil erosion, water quality, fish and wildlife, plant condition, and all other appropriate resource concerns.

Before Situation:
Producer has no plan or limited knowledge of management of livestock or other animals on grazed land resources. The producer currently manages animals without a plan to address identified natural resource concerns. Producer is interested in management of animals to maximize profit margins, reduce costs, improve or address wildlife opportunities, and for other environmental benefit. Producer is willing to collaborate with a certified TSP to develop a plan and idenify problems and opportunities, determine objectives, inventory resources, analyze resource data, formulate alternatives, evaluate alternatives, and make decisions to meet objectives.

After Situation:
After EQIP contract approval, participant has obtained services from a certified TSP for development of the Conservation Planning Activity (CPA) plan for grazing lands. The CPA requires the plan to meet the General Requirements (steps 1-7) of the planning process. Step 1- Identify Problems and Opportunities, Step 2- Determine Objectives, Step 3-Inventory Resources, Step 4-Analyze Resource Data, Step 5-Formulate Alternatives, Step 6-Evaluate Alternatives, and Step 7-Make Decisions (Select Preferrred Alternative). The plan may include recommendations for associated conservation practices which address other related resource concerns. The CPA meets the basic quality criteria for the CPA 110 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: 1

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $4,390.68

Scenario Cost/Unit: $4,390.68

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, range conservation	1299	Conservation Activity Plan labor to study, plan the use and management of rangelands to maximize their use in a sustainable manner. Range managers may inventory soils, plants, and animals; develop resource management plans; identify monitoring methods and collect data using those methods to determine if resource management objectives are being met or if adjustments to management activities are needed. For example, they may help ranchers attain optimum livestock production by determining the number and kind of animals to graze, the grazing system to use, and the best season for grazing. Cost associated with this component includes overhead and benefits (market price).	Hours	$104.54	42	$4,390.68

Practice: 110 - Grazing Management Plan

Scenario: #135 - Conservation Plan for Grazed Lands 5,001 to 10,000 acres

Scenario Description:

Site specific conservation plan for grazed lands for an agricultural operation with 5,001 to 10,000 acres grazed land. The following natural resource concerns will be addressed: soil erosion, water quality, fish and wildlife, plant condition, and all other appropriate resource concerns.

Before Situation:

Producer has no plan or limited knowledge of management of livestock or other animals on grazed land resources. The producer currently manages animals without a plan to address identified natural resource concerns. Producer is interested in management of animals to maximize profit margins, reduce costs, improve or address wildlife opportunities, and for other environmental benefit. Producer is willing to collaborate with a certified TSP to develop a plan and idenify problems and opportunities, determine objectives, inventory resources, analyze resource data, formulate alternatives, evaluate alternatives, and make decisions to meet objectives.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Conservation Planning Activity (CPA) plan for grazing lands. The CPA requires the plan to meet the General Requirements (steps 1-7) of the planning process. Step 1- Identify Problems and Opportunities, Step 2- Determine Objectives, Step 3-Inventory Resources, Step 4-Analyze Resource Data, Step 5-Formulate Alternatives, Step 6-Evaluate Alternatives, and Step 7-Make Decisions (Select Preferrred Alternative). The plan may include recommendations for associated conservation practices which address other related resource concerns. The CPA meets the basic quality criteria for the CPA 110 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: 1

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $5,017.92

Scenario Cost/Unit: $5,017.92

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, range conservation	1299	Conservation Activity Plan labor to study, plan the use and management of rangelands to maximize their use in a sustainable manner. Range managers may inventory soils, plants, and animals; develop resource management plans; identify monitoring methods and collect data using those methods to determine if resource management objectives are being met or if adjustments to management activities are needed. For example, they may help ranchers attain optimum livestock production by determining the number and kind of animals to graze, the grazing system to use, and the best season for grazing. Cost associated with this component includes overhead and benefits (market price).	Hours	$104.54	48	$5,017.92

Practice: 110 - Grazing Management Plan

Scenario: #151 - Conservation Plan for Grazed Lands >10,000 acres

Scenario Description:

Site specific conservation plan for grazed lands for an agricultural operation with greater than 10,000 acres grazed land. The following natural resource concerns will be addressed: soil erosion, water quality, fish and wildlife, plant condition, and all other appropriate resource concerns.

Before Situation:

Producer has no plan or limited knowledge of management of livestock or other animals on grazed land resources. The producer currently manages animals without a plan to address identified natural resource concerns. Producer is interested in management of animals to maximize profit margins, reduce costs, improve or address wildlife opportunities, and for other environmental benefit. Producer is willing to collaborate with a certified TSP to develop a plan and identify problems and opportunities, determine objectives, inventory resources, analyze resource data, formulate alternatives, evaluate alternatives, and make decisions to meet objectives.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Conservation Planning Activity (CPA) plan for grazing lands. The CPA requires the plan to meet the General Requirements (steps 1-7) of the planning process. Step 1- Identify Problems and Opportunities, Step 2- Determine Objectives, Step 3-Inventory Resources, Step 4-Analyze Resource Data, Step 5-Formulate Alternatives, Step 6-Evaluate Alternatives, and Step 7-Make Decisions (Select Preferred Alternative). The plan may include recommendations for associated conservation practices which address other related resource concerns. The CPA meets the basic quality criteria for the CPA 110 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: 1

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $5,645.16

Scenario Cost/Unit: $5,645.16

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, range conservation	1299	Conservation Activity Plan labor to study, plan the use and management of rangelands to maximize their use in a sustainable manner. Range managers may inventory soils, plants, and animals; develop resource management plans; identify monitoring methods and collect data using those methods to determine if resource management objectives are being met or if adjustments to management activities are needed. For example, they may help ranchers attain optimum livestock production by determining the number and kind of animals to graze, the grazing system to use, and the best season for grazing. Cost associated with this component includes overhead and benefits (market price).	Hours	$104.54	54	$5,645.16

Practice: 116 - Soil Health Management Plan

Scenario: #85 - Organic Crops + Livestock, <5

Scenario Description:

Evaluate soil health concerns and develop a transitional cropping management plan to improve overall soil health and address all 4 soil health principles. The plan includes management activities or land management practices associated with crop and forage production. The soil health management plan ensures that the purposes of crop and forage production and preservation of natural resources related to soil health are compatible. May simultaneously implement 216 Soil Health Testing CEMA to evaluate baseline soil health and inventory basic or additional soil health indicators. The plan is developed for fewer than 5 Soil Health Management Units (SHMU) for organic crops and livestock. A SHMU is 1 or more planning land units with similar soil type, land use, and management. A SHMU can vary in size or acreage depending on soil texture, topography, and cropping system.

Before Situation:

The producer currently manages without an existing soil health management plan, or with an outdated plan. Resource concerns exist which are not addressed by a management plan.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of a Soil Health Conservation Plan Activity (CPA). The CPA criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $2,917.88

Scenario Cost/Unit: $2,917.88

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$85.82	34	$2,917.88

Practice: 116 - Soil Health Management Plan

Scenario: #101 - Organic Crops, 5 or more

Scenario Description:

Evaluate soil health concerns and develop a transitional cropping management plan to improve overall soil health and address all 4 soil health principles. The plan includes management activities or land management practices associated with crop and forage production. The soil health management plan ensures that the purposes of crop and forage production and preservation of natural resources related to soil health are compatible. May simultaneously implement 216 Soil Health Testing CEMA to evaluate baseline soil health and inventory basic or additional soil health indicators. The plan is developed for 5 or more Soil Health Management Units (SHMU) for organic crops. A SHMU is 1 or more planning land units with similar soil type, land use, and management. A SHMU can vary in size or acreage depending on soil texture, topography, and cropping system.

Before Situation:

The producer currently manages without an existing soil health management plan, or with an outdated plan. Resource concerns exist which are not addressed by a management plan.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of a Soil Health Conservation Plan Activity (CPA). The CPA criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $2,746.24

Scenario Cost/Unit: $2,746.24

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$85.82	32	$2,746.24

Practice: 116 - Soil Health Management Plan

Scenario: #117 - Small Farm

Scenario Description:

Evaluate soil health concerns and develop a transitional cropping management plan to improve overall soil health and address all 4 soil health principles. The plan includes management activities or land management practices associated with crop and forage production. The soil health management plan ensures that the purposes of crop and forage production and preservation of natural resources related to soil health are compatible. May simultaneously implement 216 Soil Health Testing CEMA to evaluate baseline soil health and inventory basic or additional soil health indicators. The plan is developed for a small farm (<10 acres).

Before Situation:

The producer currently manages without an existing soil health management plan, or with an outdated plan. Resource concerns exist which are not addressed by a management plan.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of a Soil Health Conservation Plan Activity (CPA). The CPA criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $1,716.40

Scenario Cost/Unit: $1,716.40

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$85.82	20	$1,716.40

Practice: 116 - Soil Health Management Plan

Scenario: #133 - Organic Crops + Livestock, 5 or more

Scenario Description:

Evaluate soil health concerns and develop a transitional cropping management plan to improve overall soil health and address all 4 soil health principles. The plan includes management activities or land management practices associated with crop and forage production. The soil health management plan ensures that the purposes of crop and forage production and preservation of natural resources related to soil health are compatible. May simultaneously implement 216 Soil Health Testing CEMA to evaluate baseline soil health and inventory basic or additional soil health indicators. The plan is developed for 5 or more Soil Health Management Units (SHMU) for organic crops and livestock. A SHMU is 1 or more planning land units with similar soil type, land use, and management. A SHMU can vary in size or acreage depending on soil texture, topography, and cropping system.

Before Situation:

The producer currently manages without an existing soil health management plan, or with an outdated plan. Resource concerns exist which are not addressed by a management plan.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of a Soil Health Conservation Plan Activity (CPA). The CPA criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $3,089.52

Scenario Cost/Unit: $3,089.52

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$85.82	36	$3,089.52

Practice: 116 - Soil Health Management Plan

Scenario: #149 - Crops+Livestock, 5 or more

Scenario Description:

Evaluate soil health concerns and develop a transitional cropping management plan to improve overall soil health and address all 4 soil health principles. The plan includes management activities or land management practices associated with crop and forage production. The soil health management plan ensures that the purposes of crop and forage production and preservation of natural resources related to soil health are compatible. May simultaneously implement 216 Soil Health Testing CEMA to evaluate baseline soil health and inventory basic or additional soil health indicators. The plan is developed for 5 or more Soil Health Management Units (SHMU) for crops and livestock. A SHMU is 1 or more planning land units with similar soil type, land use, and management. A SHMU can vary in size or acreage depending on soil texture, topography, and cropping system.

Before Situation:

The producer currently manages without an existing soil health management plan, or with an outdated plan. Resource concerns exist which are not addressed by a management plan.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of a Soil Health Conservation Plan Activity (CPA). The CPA criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $2,574.60

Scenario Cost/Unit: $2,574.60

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$85.82	30	$2,574.60

Practice: 116 - Soil Health Management Plan

Scenario: #165 - Crops+Livestock, <5

Scenario Description:

Evaluate soil health concerns and develop a transitional cropping management plan to improve overall soil health and address all 4 soil health principles. The plan includes management activities or land management practices associated with crop and forage production. The soil health management plan ensures that the purposes of crop and forage production and preservation of natural resources related to soil health are compatible. May simultaneously implement 216 Soil Health Testing CEMA to evaluate baseline soil health and inventory basic or additional soil health indicators. The plan is developed for fewer than 5 Soil Health Management Units (SHMU) for crops and livestock. A SHMU is 1 or more planning land units with similar soil type, land use, and management. A SHMU can vary in size or acreage depending on soil texture, topography, and cropping system.

Before Situation:

The producer currently manages without an existing soil health management plan, or with an outdated plan. Resource concerns exist which are not addressed by a management plan.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of a Soil Health Conservation Plan Activity (CPA). The CPA criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $2,059.68

Scenario Cost/Unit: $2,059.68

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$85.82	24	$2,059.68

Practice: 116 - Soil Health Management Plan

Scenario: #181 - Organic Crops, <5

Scenario Description:

Evaluate soil health concerns and develop a transitional cropping management plan to improve overall soil health and address all 4 soil health principles. The plan includes management activities or land management practices associated with crop and forage production. The soil health management plan ensures that the purposes of crop and forage production and preservation of natural resources related to soil health are compatible. May simultaneously implement 216 Soil Health Testing CEMA to evaluate baseline soil health and inventory basic or additional soil health indicators. The plan is developed for fewer than 5 Soil Health Management Units (SHMU) for organic crops. A SHMU is 1 or more planning land units with similar soil type, land use, and management. A SHMU can vary in size or acreage depending on soil texture, topography, and cropping system.

Before Situation:

The producer currently manages without an existing soil health management plan, or with an outdated plan. Resource concerns exist which are not addressed by a management plan.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of a Soil Health Conservation Plan Activity (CPA). The CPA criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $2,231.32

Scenario Cost/Unit: $2,231.32

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$85.82	26	$2,231.32

Practice: 116 - Soil Health Management Plan

Scenario: #197 - Crops, 5 or more

Scenario Description:

Evaluate soil health concerns and develop a transitional cropping management plan to improve overall soil health and address all 4 soil health principles. The plan includes management activities or land management practices associated with crop and forage production. The soil health management plan ensures that the purposes of crop and forage production and preservation of natural resources related to soil health are compatible. May simultaneously implement 216 Soil Health Testing CEMA to evaluate baseline soil health and inventory basic or additional soil health indicators. The plan is developed for 5 or more Soil Health Management Units (SHMU) for crops. A SHMU is 1 or more planning land units with similar soil type, land use, and management. A SHMU can vary in size or acreage depending on soil texture, topography, and cropping system.

Before Situation:

The producer currently manages without an existing soil health management plan, or with an outdated plan. Resource concerns exist which are not addressed by a management plan.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of a Soil Health Conservation Plan Activity (CPA). The CPA criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $2,402.96

Scenario Cost/Unit: $2,402.96

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$85.82	28	$2,402.96

Practice: 116 - Soil Health Management Plan

Scenario: #213 - Crops, <5

Scenario Description:

Evaluate soil health concerns and develop a transitional cropping management plan to improve overall soil health and address all 4 soil health principles. The plan includes management activities or land management practices associated with crop and forage production. The soil health management plan ensures that the purposes of crop and forage production and preservation of natural resources related to soil health are compatible. May simultaneously implement 216 Soil Health Testing CEMA to evaluate baseline soil health and inventory basic or additional soil health indicators. The plan is developed for fewer than 5 Soil Health Management Units (SHMU) for crops. A SHMU is 1 or more planning land units with similar soil type, land use, and management. A SHMU can vary in size or acreage depending on soil texture, topography, and cropping system.

Before Situation:

The producer currently manages without an existing soil health management plan, or with an outdated plan. Resource concerns exist which are not addressed by a management plan.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of a Soil Health Conservation Plan Activity (CPA). The CPA criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $1,888.04

Scenario Cost/Unit: $1,888.04

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$85.82	22	$1,888.04

Practice: 120 - Agricultural Energy Design

Scenario: #5 - High Complexity, 6+ Designs

Scenario Description:

An agricultural producer wishes to conserve energy through an EQIP contract with multiple energy practice scenarios. Associated scenario(s) provide for retrofits that impose several variables in the design process. The scenarios may involve a change in service levels that cannot be evaluated or designed through use of simple tools or manual calculations. Four factors typically indicate a ???High Complexity??? system, as follows. 1) Client objectives require a change of output (hp, Btu/hr, lux, etc.) that varies more than about 30% from old devices. 2) System constraints prevent new devices from being installed in the same location as the old devices. 3) The retrofit requires substantive changes to two or more of the electrical, mechanical, plumbing, or structural systems. 4) Complex analysis to evaluate alternatives is required to confirm level of service and appropriate device output, placement, etc. (For example, a detailed simulation is required to determine systems sizing and layout.) ???High Complexity??? practice scenarios include but are not limited to: comprehensive lighting system redesign; radiant heating systems; convert to tunnel ventilation; or convert to bench heating. Each ???Design??? indicates that new devices or components are closely related to other devices or components even if numerous scenarios are contracted. If more than five practices are contracted, then, at a minimum, ???6+ Designs??? shall be contracted for the Ag Energy DIA. Use this scenario if at least one design is deemed high complexity. The Ag Energy DIA includes reviewing, and, when needed, revising alternatives to address energy concerns. The Ag Energy DIA documents: a) the client???s final decisions related to the associated energy practice scenarios, b) estimated energy and greenhouse gas benefits; and c) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

Before Situation:

Producer wants to transition their agricultural operation to become more energy efficient. Producer intends to work with a certified TSP to develop designs to implement one or more practice scenarios to address Energy Efficiency resource concerns using the Ag Energy DIA. The DIA 120 criteria incorporates recommended measures to increase energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Energy Efficient Lighting System, 672 Energy Efficient Building Envelope, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

After Situation:

The producer has obtained services from a certified TSP to develop practice scenario designs using the Ag Energy DIA. The DIA 120 criteria include tasks needed to document the client???s decision, energy savings and design of conservation practices which address energy efficiency. The Ag Energy DIA meets the quality criteria for the DIA 120 activity as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $11,048.97

Scenario Cost/Unit: $11,048.97

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	78	$8,324.16
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$51.35	15	$770.25
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$34.20	6	$205.20
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hours	$72.89	24	$1,749.36

Practice: 120 - Agricultural Energy Design

Scenario: #21 - Medium Complexity, 6+ Designs

Scenario Description:

An agricultural producer wishes to conserve energy through an EQIP contract with multiple energy practice scenarios. Associated scenario(s) provide for retrofits that impose some variables in the design process. The scenarios may involve a change in service levels that can be evaluated or designed through use of simple tools or manual calculations. Four factors typically indicate a ???Medium Complexity??? system, as follows. 1) Client objectives require a change of output (hp, Btu/hr, lux, etc.) that varies more than about 10% from old devices. 2) System constraints prevent new devices from being installed in the same location as the old devices. 3) The retrofit requires substantive changes to either electrical, mechanical, plumbing, or structural systems. 4) Analysis beyond the scope of NRCS methodology to evaluate alternatives is required to confirm level of service and appropriate device output, placement, etc. (For example, a simplified heat transfer model to determine heating, ventilation, and cooling loads may be required if existing device capacity cannot be estimated.) ???Medium Complexity??? practice scenarios include but are not limited to: change of lighting fixture counts or layout; wall insulation; grain dryers; add reverse osmosis to syrup production; or add evaporative cooling systems (cooling cells). Each ???Design??? indicates that new devices or components are closely related to other devices or components even if numerous scenarios are contracted. If more than five practices are contracted, then, at a minimum, ???6+ Designs??? shall be contracted for the Ag Energy DIA. If at least 1 scenario is more complex than indicated herein, use an alternate scenario for contracting. The Ag Energy DIA includes reviewing, and, when needed, revising alternatives to address energy concerns. The Ag Energy DIA documents: a) the client???s final decisions related to the associated energy practice scenarios, b) estimated energy and greenhouse gas benefits; and c) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

Before Situation:

Producer wants to transition their agricultural operation to become more energy efficient. Producer intends to work with a certified TSP to develop designs to implement one or more practice scenarios to address Energy Efficiency resource concerns using the Ag Energy DIA. The DIA 120 criteria incorporates recommended measures to increase energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Energy Efficient Lighting System, 672 Energy Efficient Building Envelope, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

After Situation:

The producer has obtained services from a certified TSP to develop practice scenario designs using the Ag Energy DIA. The DIA 120 criteria include tasks needed to document the client???s decision, energy savings and design of conservation practices which address energy efficiency. The Ag Energy DIA meets the quality criteria for the DIA 120 activity as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $9,537.00

Scenario Cost/Unit: $9,537.00

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	66	$7,043.52
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$51.35	14	$718.90
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$34.20	5	$171.00
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hours	$72.89	22	$1,603.58

Practice: 120 - Agricultural Energy Design

Scenario: #37 - Low Complexity, 6+ Designs

Scenario Description:

An agricultural producer wishes to conserve energy through an EQIP contract with multiple energy practice scenarios. Associated scenario(s) provide for one-to-one device retrofits. The scenario(s) may provide for a new component to modify the operation of an existing device (e.g., timer to reduce run-time). Three factors typically indicate a ???Low Complexity??? system, as follows. 1) New devices maintain output (hp, Btu/hr, lux, etc.) of the old devices within a roughly 10% range. 2) New devices are installed in the same location as the old devices. 3) The retrofit does not require substantive changes to electrical, mechanical, plumbing, or structural systems. ???Low Complexity??? practice scenarios include but are not limited to: lamp or fixture upgrades; attic insulation; fans; or washer-extractors. Each ???Design??? indicates that new devices or components are closely related to other devices or components even if numerous scenarios are contracted. If more than five practices are contracted, then, at a minimum, ???6+ Designs??? shall be contracted for the Ag Energy DIA. If at least 1 scenario is more complex than indicated herein, use an alternate scenario for contracting. The Ag Energy DIA includes reviewing, and, when needed, revising alternatives to address energy concerns. The Ag Energy DIA documents: a) the client???s final decisions related to the associated energy practice scenarios, b) estimated energy and greenhouse gas; and c) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

Before Situation:

Producer wants to transition their agricultural operation to become more energy efficient. Producer intends to work with a certified TSP to develop designs to implement one or more practice scenarios to address Energy Efficiency resource concerns using the Ag Energy DIA. The DIA 120 criteria incorporates recommended measures to increase energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Energy Efficient Lighting System, 672 Energy Efficient Building Envelope, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

After Situation:

The producer has obtained services from a certified TSP to develop practice scenario designs using the Ag Energy DIA. The DIA 120 criteria include tasks needed to document the client???s decision, energy savings and design of conservation practices which address energy efficiency. The Ag Energy DIA meets the quality criteria for the DIA 120 activity as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $8,025.03

Scenario Cost/Unit: $8,025.03

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	54	$5,762.88
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$51.35	13	$667.55
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$34.20	4	$136.80
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hours	$72.89	20	$1,457.80

Practice: 120 - Agricultural Energy Design

Scenario: #53 - High Complexity, 4-5 Designs

Scenario Description:

An agricultural producer wishes to conserve energy through an EQIP contract with multiple energy practice scenarios. Associated scenario(s) provide for retrofits that impose several variables in the design process. The scenarios may involve a change in service levels that cannot be evaluated or designed through use of simple tools or manual calculations. Four factors typically indicate a ???High Complexity??? system, as follows. 1) Client objectives require a change of output (hp, Btu/hr, lux, etc.) that varies more than about 30% from old devices. 2) System constraints prevent new devices from being installed in the same location as the old devices. 3) The retrofit requires substantive changes to two or more of the electrical, mechanical, plumbing, or structural systems. 4) Complex analysis to evaluate alternatives is required to confirm level of service and appropriate device output, placement, etc. (For example, a detailed simulation is required to determine systems sizing and layout.) ???High Complexity??? practice scenarios include but are not limited to: comprehensive lighting system redesign; radiant heating systems; convert to tunnel ventilation; or convert to bench heating. Each ???Design??? indicates that new devices or components are closely related to other devices or components even if numerous scenarios are contracted. If more than three practices are contracted, then, at a minimum, ???4-5 Designs??? shall be contracted for the Ag Energy DIA. Use this scenario if at least one design is deemed high complexity. The Ag Energy DIA includes reviewing, and, when needed, revising alternatives to address energy concerns. The Ag Energy DIA documents: a) the client???s final decisions related to the associated energy practice scenarios, b) estimated energy and greenhouse gas benefits; and c) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

Before Situation:

Producer wants to transition their agricultural operation to become more energy efficient. Producer intends to work with a certified TSP to develop designs to implement one or more practice scenarios to address Energy Efficiency resource concerns using the Ag Energy DIA. The DIA 120 criteria incorporates recommended measures to increase energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Energy Efficient Lighting System, 672 Energy Efficient Building Envelope, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

After Situation:

The producer has obtained services from a certified TSP to develop practice scenario designs using the Ag Energy DIA. The DIA 120 criteria include tasks needed to document the client???s decision, energy savings and design of conservation practices which address energy efficiency. The Ag Energy DIA meets the quality criteria for the DIA 120 activity as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $9,391.22

Scenario Cost/Unit: $9,391.22

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	66	$7,043.52
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$51.35	14	$718.90
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$34.20	5	$171.00
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hours	$72.89	20	$1,457.80

Practice: 120 - Agricultural Energy Design

Scenario: #69 - Medium Complexity, 4-5 Designs

Scenario Description:

An agricultural producer wishes to conserve energy through an EQIP contract with multiple energy practice scenarios. Associated scenario(s) provide for retrofits that impose some variables in the design process. The scenarios may involve a change in service levels that can be evaluated or designed through use of simple tools or manual calculations. Four factors typically indicate a ???Medium Complexity??? system, as follows. 1) Client objectives require a change of output (hp, Btu/hr, lux, etc.) that varies more than about 10% from old devices. 2) System constraints prevent new devices from being installed in the same location as the old devices. 3) The retrofit requires substantive changes to either electrical, mechanical, plumbing, or structural systems. 4) Analysis beyond the scope of NRCS methodology to evaluate alternatives is required to confirm level of service and appropriate device output, placement, etc. (For example, a simplified heat transfer model to determine heating, ventilation, and cooling loads may be required if existing device capacity cannot be estimated.) ???Medium Complexity??? practice scenarios include but are not limited to: change of lighting fixture counts or layout; wall insulation; grain dryers; add reverse osmosis to syrup production; or add evaporative cooling systems (cooling cells). Each ???Design??? indicates that new devices or components are closely related to other devices or components even if numerous scenarios are contracted. If more than three practices are contracted, then, at a minimum, ???4-5 Designs??? shall be contracted for the Ag Energy DIA. If at least 1 scenario is more complex than indicated herein, use an alternate scenario for contracting. The Ag Energy DIA includes reviewing, and, when needed, revising alternatives to address energy concerns. The Ag Energy DIA documents: a) the client???s final decisions related to the associated energy practice scenarios, b) estimated energy and greenhouse gas benefits; and c) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

Before Situation:

Producer wants to transition their agricultural operation to become more energy efficient. Producer intends to work with a certified TSP to develop designs to implement one or more practice scenarios to address Energy Efficiency resource concerns using the Ag Energy DIA. The DIA 120 criteria incorporates recommended measures to increase energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Energy Efficient Lighting System, 672 Energy Efficient Building Envelope, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

After Situation:

The producer has obtained services from a certified TSP to develop practice scenario designs using the Ag Energy DIA. The DIA 120 criteria include tasks needed to document the client???s decision, energy savings and design of conservation practices which address energy efficiency. The Ag Energy DIA meets the quality criteria for the DIA 120 activity as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $7,879.25

Scenario Cost/Unit: $7,879.25

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	54	$5,762.88
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$51.35	13	$667.55
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$34.20	4	$136.80
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hours	$72.89	18	$1,312.02

Practice: 120 - Agricultural Energy Design

Scenario: #85 - Low Complexity, 4-5 Designs

Scenario Description:

An agricultural producer wishes to conserve energy through an EQIP contract with multiple energy practice scenarios. Associated scenario(s) provide for one-to-one device retrofits. The scenario(s) may provide for a new component to modify the operation of an existing device (e.g., timer to reduce run-time). Three factors typically indicate a ???Low Complexity??? system, as follows. 1) New devices maintain output (hp, Btu/hr, lux, etc.) of the old devices within a roughly 10% range. 2) New devices are installed in the same location as the old devices. 3) The retrofit does not require substantive changes to electrical, mechanical, plumbing, or structural systems. ???Low Complexity??? practice scenarios include but are not limited to: lamp or fixture upgrades; attic insulation; fans; or washer-extractors. Each ???Design??? indicates that new devices or components are closely related to other devices or components even if numerous scenarios are contracted. If more than three practices are contracted, then, at a minimum, ???4-5 Designs??? shall be contracted for the Ag Energy DIA. If at least 1 scenario is more complex than indicated herein, use an alternate scenario for contracting. The Ag Energy DIA includes reviewing, and, when needed, revising alternatives to address energy concerns. The Ag Energy DIA documents: a) the client???s final decisions related to the associated energy practice scenarios, b) estimated energy and greenhouse gas benefits; and c) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

Before Situation:

Producer wants to transition their agricultural operation to become more energy efficient. Producer intends to work with a certified TSP to develop designs to implement one or more practice scenarios to address Energy Efficiency resource concerns using the Ag Energy DIA. The DIA 120 criteria incorporates recommended measures to increase energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Energy Efficient Lighting System, 672 Energy Efficient Building Envelope, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

After Situation:

The producer has obtained services from a certified TSP to develop practice scenario designs using the Ag Energy DIA. The DIA 120 criteria include tasks needed to document the client???s decision, energy savings and design of conservation practices which address energy efficiency. The Ag Energy DIA meets the quality criteria for the DIA 120 activity as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $6,367.28

Scenario Cost/Unit: $6,367.28

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	42	$4,482.24
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$51.35	12	$616.20
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$34.20	3	$102.60
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hours	$72.89	16	$1,166.24

Practice: 120 - Agricultural Energy Design

Scenario: #101 - High Complexity, 2-3 Designs

Scenario Description:

An agricultural producer wishes to conserve energy through an EQIP contract with multiple energy practice scenarios. Associated scenario(s) provide for retrofits that impose several variables in the design process. The scenarios may involve a change in service levels that cannot be evaluated or designed through use of simple tools or manual calculations. Four factors typically indicate a ???High Complexity??? system, as follows. 1) Client objectives require a change of output (hp, Btu/hr, lux, etc.) that varies more than about 30% from old devices. 2) System constraints prevent new devices from being installed in the same location as the old devices. 3) The retrofit requires substantive changes to two or more of the electrical, mechanical, plumbing, or structural systems. 4) Complex analysis to evaluate alternatives is required to confirm level of service and appropriate device output, placement, etc. (For example, a detailed simulation is required to determine systems sizing and layout.) ???High Complexity??? practice scenarios include but are not limited to: comprehensive lighting system redesign; radiant heating systems; convert to tunnel ventilation; or convert to bench heating. Each ???Design??? indicates that new devices or components are closely related to other devices or components even if numerous scenarios are contracted. If more than one practice is contracted, then, at a minimum, ???2-3 Designs??? shall be contracted for the Ag Energy DIA. Use this scenario if at least one design is deemed high complexity. The Ag Energy DIA includes reviewing, and, when needed, revising alternatives to address energy concerns. The Ag Energy DIA documents: a) the client???s final decisions related to the associated energy practice scenarios, b) estimated energy and greenhouse gas; and c) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

Before Situation:

Producer wants to transition their agricultural operation to become more energy efficient. Producer intends to work with a certified TSP to develop designs to implement one or more practice scenarios to address Energy Efficiency resource concerns using the Ag Energy DIA. The DIA 120 criteria incorporates recommended measures to increase energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Energy Efficient Lighting System, 672 Energy Efficient Building Envelope, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

After Situation:

The producer has obtained services from a certified TSP to develop practice scenario designs using the Ag Energy DIA. The DIA 120 criteria include tasks needed to document the client???s decision, energy savings and design of conservation practices which address energy efficiency. The Ag Energy DIA meets the quality criteria for the DIA 120 activity as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $7,733.47

Scenario Cost/Unit: $7,733.47

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	54	$5,762.88
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$51.35	13	$667.55
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$34.20	4	$136.80
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hours	$72.89	16	$1,166.24

Practice: 120 - Agricultural Energy Design

Scenario: #117 - Medium Complexity, 2-3 Designs

Scenario Description:

An agricultural producer wishes to conserve energy through an EQIP contract with multiple energy practice scenarios. Associated scenario(s) provide for retrofits that impose some variables in the design process. The scenarios may involve a change in service levels that can be evaluated or designed through use of simple tools or manual calculations. Four factors typically indicate a ???Medium Complexity??? system, as follows. 1) Client objectives require a change of output (hp, Btu/hr, lux, etc.) that varies more than about 10% from old devices. 2) System constraints prevent new devices from being installed in the same location as the old devices. 3) The retrofit requires substantive changes to either electrical, mechanical, plumbing, or structural systems. 4) Analysis beyond the scope of NRCS methodology to evaluate alternatives is required to confirm level of service and appropriate device output, placement, etc. (For example, a simplified heat transfer model to determine heating, ventilation, and cooling loads may be required if existing device capacity cannot be estimated.) ???Medium Complexity??? practice scenarios include but are not limited to: change of lighting fixture counts or layout; wall insulation; grain dryers; add reverse osmosis to syrup production; or add evaporative cooling systems (cooling cells). Each ???Design??? indicates that new devices or components are closely related to other devices or components even if numerous scenarios are contracted. If more than one practice is contracted, then, at a minimum, ????2-3 Designs??? shall be contracted for theAg Energy DIA. If at least 1 scenario is more complex than indicated herein, use an alternate scenario for contracting. The Ag Energy DIA includes reviewing, and, when needed, revising alternatives to address energy concerns. The Ag Energy DIA documents: a) the client???s final decisions related to the associated energy practice scenarios, b) estimated energy and greenhouse gas benefits; and c) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

Before Situation:

Producer wants to transition their agricultural operation to become more energy efficient. Producer intends to work with a certified TSP to develop designs to implement one or more practice scenarios to address Energy Efficiency resource concerns using the Ag Energy DIA. The DIA 120 criteria incorporates recommended measures to increase energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Energy Efficient Lighting System, 672 Energy Efficient Building Envelope, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

After Situation:

The producer has obtained services from a certified TSP to develop practice scenario designs using the Ag Energy DIA. The DIA 120 criteria include tasks needed to document the client???s decision, energy savings and design of conservation practices which address energy efficiency. The Ag Energy DIA meets the quality criteria for the DIA 120 activity as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $6,221.50

Scenario Cost/Unit: $6,221.50

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	42	$4,482.24
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$51.35	12	$616.20
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$34.20	3	$102.60
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hours	$72.89	14	$1,020.46

Practice: 120 - Agricultural Energy Design

Scenario: #133 - Low Complexity, 2-3 Designs

Scenario Description:

An agricultural producer wishes to conserve energy through an EQIP contract with multiple energy practice scenarios. Associated scenario(s) provide for one-to-one device retrofits. The scenario(s) may provide for a new component to modify the operation of an existing device (e.g., timer to reduce run-time). Three factors typically indicate a ???Low Complexity??? system, as follows. 1) New devices maintain output (hp, Btu/hr, lux, etc.) of the old devices within a roughly 10% range. 2) New devices are installed in the same location as the old devices. 3) The retrofit does not require substantive changes to electrical, mechanical, plumbing, or structural systems. ???Low Complexity??? practice scenarios include but are not limited to: lamp or fixture upgrades; attic insulation; fans; or washer-extractors. Each ???Design??? indicates that new devices or components are closely related to other devices or components even if numerous scenarios are contracted. If more than one practice is contracted, then, at a minimum, ????2-3 Designs??? shall be contracted for the Ag Energy DIA. If at least 1 scenario is more complex than indicated herein, use an alternate scenario for contracting. The Ag Energy DIA includes reviewing, and, when needed, revising alternatives to address energy concerns. The Ag Energy DIA documents: a) the client???s final decisions related to the associated energy practice scenarios, b) estimated energy and greenhouse gas benefits; and c) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

Before Situation:

Producer wants to transition their agricultural operation to become more energy efficient. Producer intends to work with a certified TSP to develop designs to implement one or more practice scenarios to address Energy Efficiency resource concerns using the Ag Energy DIA. The DIA 120 criteria incorporates recommended measures to increase energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Energy Efficient Lighting System, 672 Energy Efficient Building Envelope, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

After Situation:

The producer has obtained services from a certified TSP to develop practice scenario designs using the Ag Energy DIA. The DIA 120 criteria include tasks needed to document the client???s decision, energy savings and design of conservation practices which address energy efficiency. The Ag Energy DIA meets the quality criteria for the DIA 120 activity as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $4,709.53

Scenario Cost/Unit: $4,709.53

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	30	$3,201.60
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$51.35	11	$564.85
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$34.20	2	$68.40
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hours	$72.89	12	$874.68

Practice: 120 - Agricultural Energy Design

Scenario: #149 - High Complexity, 1 Design

Scenario Description:

An agricultural producer wishes to conserve energy through an EQIP contract with at least one (1) energy practice scenario. Associated scenario(s) provide for retrofits that impose several variables in the design process. The scenarios may involve a change in service levels that cannot be evaluated or designed through use of simple tools or manual calculations. Four factors typically indicate a ???High Complexity??? system, as follows. 1) Client objectives require a change of output (hp, Btu/hr, lux, etc.) that varies more than about 30% from old devices. 2) System constraints prevent new devices from being installed in the same location as the old devices. 3) The retrofit requires substantive changes to two or more of the electrical, mechanical, plumbing, or structural systems. 4) Complex analysis to evaluate alternatives is required to confirm level of service and appropriate device output, placement, etc. (For example, a detailed simulation is required to determine systems sizing and layout.) ???High Complexity??? practice scenarios include but are not limited to: comprehensive lighting system redesign; radiant heating systems; convert to tunnel ventilation; or convert to bench heating. ???One Design??? indicates that each new device or component is closely related to other devices or components even if numerous scenarios are contracted. The Ag Energy DIA includes reviewing, and, when needed, revising alternatives to address energy concerns. The Ag Energy DIA documents: a) the client???s final decisions related to the associated energy practice scenarios, b) estimated energy and greenhouse gas benefits; and c) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

Before Situation:

Producer wants to transition their agricultural operation to become more energy efficient. Producer intends to work with a certified TSP to develop designs to implement one or more practice scenarios to address Energy Efficiency resource concerns using the Ag Energy DIA. The DIA 120 criteria incorporates recommended measures to increase energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Energy Efficient Lighting System, 672 Energy Efficient Building Envelope, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

After Situation:

The producer has obtained services from a certified TSP to develop practice scenario designs using the Ag Energy DIA. The DIA 120 criteria include tasks needed to document the client???s decision, energy savings and design of conservation practices which address energy efficiency. The Ag Energy DIA meets the quality criteria for the DIA 120 activity as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $6,075.72

Scenario Cost/Unit: $6,075.72

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	42	$4,482.24
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$51.35	12	$616.20
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$34.20	3	$102.60
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hours	$72.89	12	$874.68

Practice: 120 - Agricultural Energy Design

Scenario: #165 - Medium Complexity, 1 Design

Scenario Description:

An agricultural producer wishes to conserve energy through an EQIP contract with at least one (1) energy practice scenario. Associated scenario(s) provide for retrofits that impose some variables in the design process. The scenarios may involve a change in service levels that can be evaluated or designed through use of simple tools or manual calculations. Four factors typically indicate a ???Medium Complexity??? system, as follows. 1) Client objectives require a change of output (hp, Btu/hr, lux, etc.) that varies more than about 10% from old devices. 2) System constraints prevent new devices from being installed in the same location as the old devices. 3) The retrofit requires substantive changes to either electrical, mechanical, plumbing, or structural systems. 4) Analysis beyond the scope of NRCS methodology to evaluate alternatives is required to confirm level of service and appropriate device output, placement, etc. (For example, a simplified heat transfer model to determine heating, ventilation, and cooling loads may be required if existing device capacity cannot be estimated.) ???Medium Complexity??? practice scenarios include but are not limited to: change of lighting fixture counts or layout; wall insulation; grain dryers; add reverse osmosis to syrup production; or add evaporative cooling systems (cooling cells). ???One Design??? indicates that each new device or component is closely related to other devices or components even if numerous scenarios are contracted. The Ag Energy DIA includes reviewing, and, when needed, revising alternatives to address energy concerns. The Ag Energy DIA documents: a) the client???s final decisions related to the associated energy practice scenarios, b) estimated energy and greenhouse gas benefits; and c) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

Before Situation:

Producer wants to transition their agricultural operation to become more energy efficient. Producer intends to work with a certified TSP to develop designs to implement one or more practice scenarios to address Energy Efficiency resource concerns using the Ag Energy DIA. The DIA 120 criteria incorporates recommended measures to increase energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Energy Efficient Lighting System, 672 Energy Efficient Building Envelope, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

After Situation:

The producer has obtained services from a certified TSP to develop practice scenario designs using the Ag Energy DIA. The DIA 120 criteria include tasks needed to document the client???s decision, energy savings and design of conservation practices which address energy efficiency. The Ag Energy DIA meets the quality criteria for the DIA 120 activity as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $4,563.75

Scenario Cost/Unit: $4,563.75

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	30	$3,201.60
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$51.35	11	$564.85
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$34.20	2	$68.40
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hours	$72.89	10	$728.90

Practice: 120 - Agricultural Energy Design

Scenario: #181 - Low Complexity, 1 Design

Scenario Description:

An agricultural producer wishes to conserve energy through an EQIP contract with at least one (1) energy practice scenario. Associated scenario(s) provide for one-to-one device retrofits. The scenario(s) may provide for a new component to modify the operation of an existing device (e.g., timer to reduce run-time). Three factors typically indicate a ???Low Complexity??? system, as follows. 1) New devices maintain output (hp, Btu/hr, lux, etc.) of the old devices within a roughly 10% range. 2) New devices are installed in the same location as the old devices. 3) The retrofit does not require substantive changes to electrical, mechanical, plumbing, or structural systems. ???Low Complexity??? practice scenarios include but are not limited to: lamp or fixture upgrades; attic insulation; fans; or washer-extractors. ???One Design??? indicates that each new device or component is closely related to other devices or components even if numerous scenarios are contracted. The Ag Energy DIA includes reviewing, and, when needed, revising alternatives to address energy concerns. The Ag Energy DIA documents: a) the client???s final decisions related to the associated energy practice scenarios, b) estimated energy and greenhouse gas benefits; and c) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

Before Situation:

Producer wants to transition their agricultural operation to become more energy efficient. Producer intends to work with a certified TSP to develop designs to implement one or more practice scenarios to address Energy Efficiency resource concerns using the Ag Energy DIA. The DIA 120 criteria incorporates recommended measures to increase energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Energy Efficient Lighting System, 672 Energy Efficient Building Envelope, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

After Situation:

The producer has obtained services from a certified TSP to develop practice scenario designs using the Ag Energy DIA. The DIA 120 criteria include tasks needed to document the client???s decision, energy savings and design of conservation practices which address energy efficiency. The Ag Energy DIA meets the quality criteria for the DIA 120 activity as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $3,051.78

Scenario Cost/Unit: $3,051.78

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	18	$1,920.96
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$51.35	10	$513.50
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$34.20	1	$34.20
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hours	$72.89	8	$583.12

Practice: 138 - Conservation Plan Supporting Organic Transition

Scenario: #18 - Conservation Plan Supporting Organic Transition CAP Crops and Livestock

Scenario Description:
Agricultural operation where producer will transition from conventional to organic to meet USDA National Organic Program (NOP) requirements. Natural Resource Concern: Soil Erosion, Water Quality, Plant Condition, and other identified natural resource concerns.

Before Situation:
Agricultural operation currently managed using traditional and conventional methods for farming and/or ranching mixed operation of crops and livestock. The producer currently manages the operation based upon personal knowledge, or other local criteria. The producer is interested in transitioning part or all of the management unit to meet national USDA requirements for a certified operation. The producer is willing to collaborate with a certified TSP to develop a plan and collect/coordinate data recording to monitor per requirements of plan. Associated Practices: Refer to the NRCS Plan Criteria for conservation practices associated with operations transitioning to organic certification and typically needed to address identified natural resource concerns.

After Situation:
After EQIP contract approval, participant has obtained services from a certified TSP to develop the Conservation Plan Supporting Organic Transition Conservation Activity Plan (CAP) The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provides for opportunities to implement a system of conservation practices which assist the producer to transition from conventional farming or ranching to an organic production system with crops and livestock. The CAP plan will include conservation practices which address related resource concerns. The CAP meets the basic quality criteria for the 138 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $6,436.50

Scenario Cost/Unit: $6,436.50

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$85.82	75	$6,436.50

Practice: 138 - Conservation Plan Supporting Organic Transition

Scenario: #19 - Conservation Plan Supporting Organic Transition CAP Crops or Livestock

Scenario Description:
Agricultural operation where producer will transition from conventional to organic to meet USDA National Organic Program (NOP) requirements. Natural Resource Concern: Soil Erosion, Water Quality, Plant Condition, and other identified natural resource concerns.

Before Situation:
Agricultural operation currently managed using traditional and conventional methods for farming with only crops. The producer currently manages the operation based upon personal knowledge, or other local criteria. The producer is interested in transitioning part or all of the management unit to meet national USDA requirements for certified operation. The producer is willing to collaborate with a certified TSP to develop a plan and collect/coordinate data recording to monitor per requirements of plan. Associated Practices: Refer to the NRCS Plan Criteria for conservation practices associated with operations transitioning to organic certification and typically needed to address identified natural resource concerns.

After Situation:
After EQIP contract approval, participant has obtained services from a certified TSP to develop the Conservation Plan Supporting Organic Transition Conservation Activity Plan (CAP) The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provides for opportunities to implement a system of conservation practices which assist the producer to transition from conventional farming or ranching to an organic production system with crops and livestock. The CAP plan will include conservation practices which address related resource concerns. The CAP meets the basic quality criteria for the 138 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $5,492.48

Scenario Cost/Unit: $5,492.48

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$85.82	64	$5,492.48

Practice: 138 - Conservation Plan Supporting Organic Transition

Scenario: #37 - Transition to Organic- Crop, Low Complexity

Scenario Description:

A site specific conservation plan that contains planned conservation treatment activities for resource concerns resulting from the transition of conventional to organic production systems. At a minimum two alternatives will be developed. The first will be a no-action alternative in which current management activities are assumed to continue. The second will be an action alternative identifying a conservation practice or a system of conservation practices and management activities to address CPA identified resource concern(s). Additional action alternatives may be developed to identify different ways of achieving client objectives.

Before Situation:

Current crops and rotation, farming practices (tillage, nutrient application methods, timing, source, and rate), soils, and equipment and technology utilized are not considered as Organic. The producer objectives are to become organic. The effect of changes to the current cropping system are not known and new resource concerns may emerge.

After Situation:

When evaluating conservation practice effects, the short term and long term effect on natural resources and the applicability and effect on special environmental concerns identified in Step-3 (Resource Inventory) must be documented. Include recommendations that will avoid or mitigate any adverse effects on soil, water, air, plants, animals (including livestock, fish, and wildlife), energy, or human concerns; as well as on special environmental concerns. The Organic System Plan Template supplements are completed as part of NRCS Conservation Planning Activity (CPA) 138 that helps farmers who are interested in transitioning from conventional farming practices to organic production by addressing the natural resource concerns on their operation.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $5,578.30

Scenario Cost/Unit: $5,578.30

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$85.82	65	$5,578.30

Practice: 138 - Conservation Plan Supporting Organic Transition

Scenario: #53 - Transition to Organic- Crop, High Complexity

Scenario Description:

A site specific conservation plan that contains planned conservation treatment activities for resource concerns resulting from the transition of conventional to organic production systems. Crop production system is more complex based on site features, large acreage, specialty crops, irrigation, orchard and vineyards. At a minimum two alternatives will be developed. The first will be a no-action alternative in which current management activities are assumed to continue. The second will be an action alternative identifying a conservation practice or a system of conservation practices and management activities to address CPA identified resource concern(s). Additional action alternatives may be developed to identify different ways of achieving client objectives.

Before Situation:

Current crops and rotation, farming practices (tillage, nutrient application methods, timing, source, and rate), soils, and equipment and technology utilized are not considered as Organic. The producer objectives are to become organic. The effect of changes to the current cropping system are not known and new resource concerns may emerge.

After Situation:

When evaluating conservation practice effects, the short term and long term effect on natural resources and the applicability and effect on special environmental concerns identified in Step-3 (Resource Inventory) must be documented. Include recommendations that will avoid or mitigate any adverse effects on soil, water, air, plants, animals (including livestock, fish, and wildlife), energy, or human concerns; as well as on special environmental concerns. The Organic System Plan Template supplements are completed as part of NRCS Conservation Planning Activity (CPA) 138 that helps farmers who are interested in transitioning from conventional farming practices to organic production by addressing the natural resource concerns on their operation.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $6,436.50

Scenario Cost/Unit: $6,436.50

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$85.82	75	$6,436.50

Practice: 138 - Conservation Plan Supporting Organic Transition

Scenario: #69 - Transition to Organic-Livestock, Low Complexity

Scenario Description:

A site specific conservation plan that contains planned conservation treatment activities for resource concerns resulting from the transition of conventional to organic livestock systems. At a minimum two alternatives will be developed. The first will be a no-action alternative in which current management activities are assumed to continue. The second will be an action alternative identifying a conservation practice or a system of conservation practices and management activities to address CPA identified resource concern(s). Additional action alternatives may be developed to identify different ways of achieving client objectives.

Before Situation:

Current livestock production, housing, feed, equipment and technology utilized are not considered as Organic. The producer objectives are to become organic. The effect of changes to the current system are not known and new resource concerns may emerge.

After Situation:

When evaluating conservation practice effects, the short term and long term effect on natural resources and the applicability and effect on special environmental concerns identified in Step-3 (Resource Inventory) must be documented. Include recommendations that will avoid or mitigate any adverse effects on soil, water, air, plants, animals (including livestock, fish, and wildlife), energy, or human concerns; as well as on special environmental concerns. The Organic System Plan Template supplements are completed as part of NRCS Conservation Planning Activity (CPA) 138 that helps farmers who are interested in transitioning from conventional farming practices to organic production by addressing the natural resource concerns on their operation.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $6,007.40

Scenario Cost/Unit: $6,007.40

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$85.82	70	$6,007.40

Practice: 138 - Conservation Plan Supporting Organic Transition

Scenario: #85 - Transition to Organic-Livestock, High Complexity

Scenario Description:

A site specific conservation plan that contains planned conservation treatment activities for resource concerns resulting from the transition of conventional to organic livestock systems. System is high complexity based on conditions such as large Animal Units, multiple production locations, age segregation and similar management. At a minimum two alternatives will be developed. The first will be a no-action alternative in which current management activities are assumed to continue. The second will be an action alternative identifying a conservation practice or a system of conservation practices and management activities to address CPA identified resource concern(s). Additional action alternatives may be developed to identify different ways of achieving client objectives.

Before Situation:

Current livestock production, housing, feed, equipment and technology utilized are not considered as Organic. The producer objectives are to become organic. The effect of changes to the current system are not known and new resource concerns may emerge.

After Situation:

When evaluating conservation practice effects, the short term and long term effect on natural resources and the applicability and effect on special environmental concerns identified in Step-3 (Resource Inventory) must be documented. Include recommendations that will avoid or mitigate any adverse effects on soil, water, air, plants, animals (including livestock, fish, and wildlife), energy, or human concerns; as well as on special environmental concerns. The Organic System Plan Template supplements are completed as part of NRCS Conservation Planning Activity (CPA) 138 that helps farmers who are interested in transitioning from conventional farming practices to organic production by addressing the natural resource concerns on their operation.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $9,000.00

Scenario Cost/Unit: $9,000.00

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	20	$2,134.40
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$85.82	80	$6,865.60

Practice: 138 - Conservation Plan Supporting Organic Transition

Scenario: #101 - Transition to Organic- Crop and Livestock, Low Complexity

Scenario Description:

A site specific conservation plan that contains planned conservation treatment activities for resource concerns resulting from the transition of conventional to organic crop and livestock production systems. At a minimum two alternatives will be developed. The first will be a no-action alternative in which current management activities are assumed to continue. The second will be an action alternative identifying a conservation practice or a system of conservation practices and management activities to address CPA identified resource concern(s). Additional action alternatives may be developed to identify different ways of achieving client objectives.

Before Situation:

Current crops and rotation, livestock management and feeding, farming practices (tillage, nutrient application methods, timing, source, and rate), soils, and equipment and technology utilized are not considered as Organic. The producer objectives are to become organic. The effect of changes to the current cropping system are not known and new resource concerns may emerge.

After Situation:

When evaluating conservation practice effects, the short term and long term effect on natural resources and the applicability and effect on special environmental concerns identified in Step-3 (Resource Inventory) must be documented. Include recommendations that will avoid or mitigate any adverse effects on soil, water, air, plants, animals (including livestock, fish, and wildlife), energy, or human concerns; as well as on special environmental concerns. The Organic System Plan Template supplements are completed as part of NRCS Conservation Planning Activity (CPA) 138 that helps farmers who are interested in transitioning from conventional farming practices to organic production by addressing the natural resource concerns on their operation.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $6,436.50

Scenario Cost/Unit: $6,436.50

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$85.82	75	$6,436.50

Practice: 138 - Conservation Plan Supporting Organic Transition

Scenario: #117 - Transition to Organic- Crop and Livestock, High Complexity

Scenario Description:

A site specific conservation plan that contains planned conservation treatment activities for resource concerns resulting from the transition of conventional to organic crop and livestock production systems. Increased crop acreage, irrigation, specialty crops, orchards and vineyards, large AUs, age segregation management add complexity to the system. At a minimum two alternatives will be developed. The first will be a no-action alternative in which current management activities are assumed to continue. The second will be an action alternative identifying a conservation practice or a system of conservation practices and management activities to address CPA identified resource concern(s). Additional action alternatives may be developed to identify different ways of achieving client objectives.

Before Situation:

Current crops and rotation, livestock management and feeding, farming practices (tillage, nutrient application methods, timing, source, and rate), soils, and equipment and technology utilized are not considered as Organic. The producer objectives are to become organic. The effect of changes to the current cropping system are not known and new resource concerns may emerge.

After Situation:

When evaluating conservation practice effects, the short term and long term effect on natural resources and the applicability and effect on special environmental concerns identified in Step-3 (Resource Inventory) must be documented. Include recommendations that will avoid or mitigate any adverse effects on soil, water, air, plants, animals (including livestock, fish, and wildlife), energy, or human concerns; as well as on special environmental concerns. The Organic System Plan Template supplements are completed as part of NRCS Conservation Planning Activity (CPA) 138 that helps farmers who are interested in transitioning from conventional farming practices to organic production by addressing the natural resource concerns on their operation.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $9,429.10

Scenario Cost/Unit: $9,429.10

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	20	$2,134.40
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$85.82	85	$7,294.70

Practice: 140 - Transition to Organic Design

Scenario: #5 - Low Complexity 1-4 CPS

Scenario Description:
Agricultural operation where producer will transition from conventional production to organic production. They will meet the USDA National Organic Program (NOP) requirements. All Natural resources will be addressed: Soil, Water, Air, Plants and Animals. Will address resource concerns with 1 - 4, low complexity conservation practices.

Before Situation:
Agricultural operation currently managed using conventional agricultural production methods. Producer will transition all or part of the farm operation to meet national USDA NOP requirements for organic certification. The producer will collaborate with a certified TSP to develop implementation requirements and/or designs and specifications for all conservation practices required to meet organic certification requirements. Low complexity conservation practices may include: cover crop, crop rotation, reduced tillage, conservation plantings and minor structural practices for erosion control such as grass waterways and diversions.

After Situation:
After NRCS program contract is approved, participant will obtain services from a certified TSP to develop the required implementation requirements and/or designs and specifications for all conservation practices required to meet organic certification requirements. All practices installed according to field office technical guide requirements. Implementation requirements, designs and specifications all complete.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $4,919.40

Scenario Cost/Unit: $4,919.40

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$108.51	16	$1,736.16
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	16	$1,707.52
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$85.82	16	$1,373.12
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$34.20	3	$102.60

Practice: 140 - Transition to Organic Design

Scenario: #21 - Low Complexity, 5+ CPS

Scenario Description:

Agricultural operation where producer will transition from conventional production to organic production. They will meet the USDA National Organic Program (NOP) requirements. All Natural resources will be addressed: Soil, Water, Air, Plants and Animals. Will address resources concerns with 5 or more conservation practices with low complexity.

Before Situation:

Agricultural operation currently managed using conventional agricultural production methods. Producer will transition all or part of the farm operation to meet national USDA NOP requirements for organic certification. The producer will collaborate with a certified TSP to develop implementation requirements and/or designs and specifications for all conservation practices required to meet organic certification requirements. Low complexity conservation practices may include: cover crop, crop rotation, reduced tillage, conservation plantings and minor structural practices for erosion control such as grass waterways and diversions.

After Situation:

After NRCS program contract is approved, participant will obtain services from a certified TSP to develop the required implementation requirements and/or designs and specifications for all conservation practices required to meet organic certification requirements. All practices installed according to field office technical guide requirements. Implementation requirements, designs and specifications all complete.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $9,770.40

Scenario Cost/Unit: $9,770.40

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$108.51	32	$3,472.32
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	32	$3,415.04
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$85.82	32	$2,746.24
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$34.20	4	$136.80

Practice: 140 - Transition to Organic Design

Scenario: #37 - High Complexity, 1 -4 CPS

Scenario Description:
Agricultural operation where producer will transition from conventional production to organic production. They will meet the USDA National Organic Program (NOP) requirements. All Natural resources will be addressed: Soil, Water, Air, Plants, and Animals. Will address resource concerns with 1 - 4, high complexity conservation practices.

Before Situation:
Agricultural operation currently managed using conventional agricultural production methods. Producer will transition all or part of the farm operation to meet national USDA NOP requirements for organic certification. The producer will collaborate with a certified TSP to develop implementation requirements and/or designs and specifications for all conservation practices required to meet organic certification requirements. High complexity conservation practices may include: management practices for nutrients, pests, grazing, irrigation etc. and structural practices such as waste storage facility and wetland practices.

After Situation:
After NRCS program contract is approved, participant will obtain services from a certified TSP to develop the required implementation requirements and/or designs and specifications for all conservation practices required to meet organic certification requirements. All practices installed according to field office technical guide requirements. Implementation requirements, designs and specifications all complete.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $12,644.44

Scenario Cost/Unit: $12,644.44

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$108.51	40	$4,340.40
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	40	$4,268.80
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$85.82	40	$3,432.80
Cap Labor, Survey and Mapping Technician	1591	Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. May verify accuracy and completeness of maps.	Hours	$62.48	8	$499.84
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$34.20	3	$102.60

Practice: 140 - Transition to Organic Design

Scenario: #53 - High Complexity, 5+ CPS

Scenario Description:
Agricultural operation where producer will transition from conventional production to organic production. They will meet the USDA National Organic Program (NOP) requirements. All Natural resources will be addressed: Soil, Water, Air, Plants and Animals. Will address resource concerns with 5 or more, high complexity conservation practices.

Before Situation:
Agricultural operation currently managed using conventional agricultural production methods. Producer will transition all or part of the farm operation to meet national USDA NOP requirements for organic certification. The producer will collaborate with a certified TSP to develop implementation requirements and/or designs and specifications for all conservation practices required to meet organic certification requirements. High complexity conservation practices may include: management practices for nutrients, pests, grazing, irrigation etc. and structural practices such as waste storage facility and wetland practices.

After Situation:
After NRCS program contract is approved, participant will obtain services from a certified TSP to develop the required implementation requirements and/or designs and specifications for all conservation practices required to meet organic certification requirements. All practices installed according to field office technical guide requirements. Implementation requirements, designs and specifications all complete.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $16,287.76

Scenario Cost/Unit: $16,287.76

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$108.51	56	$6,076.56
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	40	$4,268.80
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$85.82	56	$4,805.92
Cap Labor, Survey and Mapping Technician	1591	Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. May verify accuracy and completeness of maps.	Hours	$62.48	16	$999.68
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$34.20	4	$136.80

Practice: 144 - Fish and Wildlife Habitat Design

Scenario: #5 - Fish & Wildlife Habitat DIA

Scenario Description:

Various on-farm land uses. Natural Resource Concerns: Terrestrial Habitat and/or Aquatic Habitat on an agricultural operation. The Fish and Wildlife Habitat Design and Implementation Activity (DIA) addresses fish and wildlife habitat management relative to only one land use on the agricultural operation.

Before Situation:

Producer has no plan or knowledge of development or management of fish and/or wildlife habitat. The producer does not currently manage or enhance habitat to promote opportunities for fish and/or wildlife habitat. Within existing land uses, the producer is interested in management of land or water features for establishment of new habitat for benefit of appropriate fish or wildlife species. Associated Practices: Applicable conservation practices cited in the DIA criteria and NRCS Field Office Technical Guide.

After Situation:

After EQIP contract approval, the participant has obtained services from a certified TSP for development of the Fish and Wildlife Habitat DIA. The DIA criteria require the plan to meet quality criteria for the primary fish/wildlife habitat resource concern and provides for opportunities to improve, restore, or enhance habitat that supports native and/or managed species. The DIA may include recommendations for associated conservation practices which address other related resource concerns. The DIA meets the basic quality criteria for the 144 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Design & Implementation Plan

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $3,272.40

Scenario Cost/Unit: $3,272.40

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, biologist	1298	Conservation Activity Plan labor to study the origins, behavior, diseases, genetics, and life processes of animals and wildlife. May specialize in wildlife research and management. May collect and analyze biological data to determine the environmental effects of present and potential use of land and water habitats. Cost associated with this component includes overhead and benefits (market price).	Hours	$90.90	36	$3,272.40

Practice: 144 - Fish and Wildlife Habitat Design

Scenario: #21 - Fish & Wildlife Habitat DIA (2 Land Uses)

Scenario Description:

Various on-farm land uses. Natural Resource Concerns: Terrestrial Habitat and/or Aquatic Habitat on an agricultural operation. The Fish and Wildlife Habitat Design and Implementation Activity (DIA) addresses fish and wildlife habitat management relative to two land uses on the agricultural operation of which each land use is at least 20 acres in size.

Before Situation:

Producer has no plan or knowledge of development or management of fish and/or wildlife habitat. The producer does not currently manage or enhance habitat to promote opportunities for fish and/or wildlife habitat. Within existing land uses, the producer is interested in management of land or water features for establishment of new habitat for benefit of appropriate fish or wildlife species. Associated Practices: Applicable conservation practices cited in the DIA criteria and NRCS Field Office Technical Guide.

After Situation:

After EQIP contract approval, the participant has obtained services from a certified TSP for development of the Fish and Wildlife Habitat DIA. The DIA criteria require the plan to meet quality criteria for the primary fish/wildlife habitat resource concern and provides for opportunities to improve, restore, or enhance habitat that supports native and/or managed species. The DIA may include recommendations for associated conservation practices which address other related resource concerns. The DIA meets the basic quality criteria for the 144 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Fish and Wildlife Habitat DIA

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $3,999.60

Scenario Cost/Unit: $3,999.60

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, biologist	1298	Conservation Activity Plan labor to study the origins, behavior, diseases, genetics, and life processes of animals and wildlife. May specialize in wildlife research and management. May collect and analyze biological data to determine the environmental effects of present and potential use of land and water habitats. Cost associated with this component includes overhead and benefits (market price).	Hours	$90.90	44	$3,999.60

Practice: 144 - Fish and Wildlife Habitat Design

Scenario: #37 - Fish & Wildlife Habitat DIA (3 or More Land Uses)

Scenario Description:

Various on-farm land uses. Natural Resource Concerns: Terrestrial Habitat and/or Aquatic Habitat on an agricultural operation. The Fish and Wildlife Habitat Design and Implementation Activity (DIA) addresses fish and wildlife habitat management relative to three or more land uses on the agricultural operation of which at least three of the land uses are at least 20 acres in size.

Before Situation:

Producer has no plan or knowledge of development or management of fish and/or wildlife habitat. The producer does not currently manage or enhance habitat to promote opportunities for fish and/or wildlife habitat. Within existing land uses, the producer is interested in management of land or water features for establishment of new habitat for benefit of appropriate fish or wildlife species. Associated Practices: Applicable conservation practices cited in the DIA criteria and NRCS Field Office Technical Guide.

After Situation:

After EQIP contract approval, the participant has obtained services from a certified TSP for development of the Fish and Wildlife Habitat DIA. The DIA criteria require the plan to meet quality criteria for the primary fish/wildlife habitat resource concern and provides for opportunities to improve, restore, or enhance habitat that supports native and/or managed species. The DIA may include recommendations for associated conservation practices which address other related resource concerns. The DIA meets the basic quality criteria for the 144 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Fish and Wildlife Habitat DIA

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $4,726.80

Scenario Cost/Unit: $4,726.80

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, biologist	1298	Conservation Activity Plan labor to study the origins, behavior, diseases, genetics, and life processes of animals and wildlife. May specialize in wildlife research and management. May collect and analyze biological data to determine the environmental effects of present and potential use of land and water habitats. Cost associated with this component includes overhead and benefits (market price).	Hours	$90.90	52	$4,726.80

Practice: 148 - Pollinator Habitat Design

Scenario: #5 - Pollinator Habitat Enhancement Plan CAP - No Local TSP

Scenario Description:
Various on-farm land uses, No qualified TSP within 300 miles. Natural Resource Concern: Fish and Wildlife, Plant Condition, Soil Erosion, Water Quality on an agricultural operation.

Before Situation:
Agricultural producer currently has no plan or knowledge of development or management of pollinator habitat. The producer does not currently manage or enhance habitat to promote opportunities for pollinator habitat. Within existing land uses, the producer may be interested in management of land or for establishment of newhabitat for benefit of appropriate pollinator species. Associated Practices: 311, 327, 328, 656, 332, 340, 342, 647, 386, 393, 412, 422, 603, 379, 512, 595, 338, 528,550, 329, 643, 391, 390, 381, 395, 580, 585, 612, 645, 601, 659, 657, 644, 380, 650.

After Situation:
After EQIP contract approval, participant has obtained services from a certified TSP for development of the Pollinator Habitat Enhancement Conservation Activity Plan (CAP). The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provides for opportunities to improve, restore, orenhance flower-rich habitat that supports native and/or managed pollinator species. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. The CAP meets the basic quality criteria for the 146 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $5,544.90

Scenario Cost/Unit: $5,544.90

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, biologist	1298	Conservation Activity Plan labor to study the origins, behavior, diseases, genetics, and life processes of animals and wildlife. May specialize in wildlife research and management. May collect and analyze biological data to determine the environmental effects of present and potential use of land and water habitats. Cost associated with this component includes overhead and benefits (market price).	Hours	$90.90	61	$5,544.90

Practice: 148 - Pollinator Habitat Design

Scenario: #21 - Pollinator Habitat Enhancement Plan CAP

Scenario Description:
Various on-farm land uses. Natural Resource Concern: Fish and Wildlife, Plant Condition, Soil Erosion, Water Quality on an agricultural operation.

Before Situation:
Agricultural producer currently has no plan or knowledge of development or management of pollinator habitat. The producer does not currently manage or enhance habitat to promote opportunities for pollinator habitat. Within existing land uses, the producer may be interested in management of land or for establishment of newhabitat for benefit of appropriate pollinator species. Associated Practices: 311, 327, 328, 656, 332, 340, 342, 647, 386, 393, 412, 422, 603, 379, 512, 595, 338, 528, 550, 329, 643, 391, 390, 381, 395, 580, 585, 612, 645, 601, 659, 657, 644, 380, 650.

After Situation:
After EQIP contract approval, participant has obtained services from a certified TSP for development of the Pollinator Habitat Enhancement Conservation Activity Plan (CAP). The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provides for opportunities to improve, restore, or enhance flower-rich habitat that supports native and/or managed pollinator species. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. The CAP meets the basic quality criteria for the 146 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $3,817.80

Scenario Cost/Unit: $3,817.80

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, biologist	1298	Conservation Activity Plan labor to study the origins, behavior, diseases, genetics, and life processes of animals and wildlife. May specialize in wildlife research and management. May collect and analyze biological data to determine the environmental effects of present and potential use of land and water habitats. Cost associated with this component includes overhead and benefits (market price).	Hours	$90.90	42	$3,817.80

Practice: 157 - Nutrient Management Design and Implementation Activity

Scenario: #5 - Design Nutrient Management for greater than 101 Acres and less than or equal to 300 Acres Fertilizer and Manure

Scenario Description:

Various on-farm land uses where natural or artificial amendments are applied. Natural Resource Concern: Water Quality, Soil Erosion, Water Quantity, and other associated resource concerns. Manure may be imported.

Before Situation:

Agricultural producer has no plan or minimal knowledge for the application and management of nutrients. The producer currently manages nutrient application based upon personal knowledge, or other local criteria. Producer is interested in management of nutrients to maximize yields, improve profit margins, reduce costs, and for environmental benefit. Producer is willing to collaborate with a certified TSP to develop a plan.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Nutrient Management conservation activity plan consistent with the criteria in DIA 157 and 590 Nutrient Management. The DIA criteria requires the plan to meet quality criteria for Soils, Water Quality and Air Quality resource concerns and other applicable resource concerns and provides for opportunities to manage nutrients for plant production and address offsite movement of nutrients. The design may include recommendations for associated conservation practices which address other related resource concerns. Meets the basic quality criteria for the DIA 157 as cited in the NRCS Field Office Technical Guide and CPS 590 Nutrient Management.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $7,595.70

Scenario Cost/Unit: $7,595.70

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$108.51	70	$7,595.70

Practice: 157 - Nutrient Management Design and Implementation Activity

Scenario: #21 - Design Nutrient Management for 101 to less than 300 Acres and No Manure

Scenario Description:
Various on-farm land uses where natural or artificial amendments are applied. Natural Resource Concern: Water Quality, Soil Erosion, Water Quantity, and other associated resource concerns.

Before Situation:
Agricultural producer has no plan or minimal knowledge for the application and management of nutrients. The producer currently manages nutrient application based upon personal knowledge, or other local criteria. Producer is interested in management of nutrients to maximize yields, improve profit margins, reduce costs, and for environmental benefit. Producer is willing to collaborate with a certified TSP to develop a plan.

After Situation:
After EQIP contract approval, participant has obtained services from a certified TSP for development of the Nutrient Management conservation activity plan consistent with the criteria in DIA 157 and 590 Nutrient Management. The DIA criteria requires the plan to meet quality criteria for Soils, Water Quality and Air Quality resource concerns and other applicable resource concerns and provides for opportunities to manage nutrients for plant production and address offsite movement of nutrients. The design may include recommendations for associated conservation practices which address other related resource concerns. Meets the basic quality criteria for the DIA 157 as cited in the NRCS Field Office Technical Guide and CPS 590 Nutrient Management.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $4,340.40

Scenario Cost/Unit: $4,340.40

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$108.51	40	$4,340.40

Practice: 157 - Nutrient Management Design and Implementation Activity

Scenario: #37 - Design Nutrient Management for greater than 300 Acres and No Manure

Scenario Description:
Various on-farm land uses where natural or artificial amendments are applied. Natural Resource Concern: Water Quality, Soil Erosion, Water Quantity, and other associated resource concerns.

Before Situation:
Agricultural producer has no plan or minimal knowledge for the application and management of nutrients. The producer currently manages nutrient application based upon personal knowledge, or other local criteria. Producer is interested in management of nutrients to maximize yields, improve profit margins, reduce costs, and for environmental benefit. Producer is willing to collaborate with a certified TSP to develop a plan.

After Situation:
After EQIP contract approval, participant has obtained services from a certified TSP for development of the Nutrient Management conservation activity plan consistent with the criteria in DIA 157 and 590 Nutrient Management. The DIA criteria requires the plan to meet quality criteria for Soils, Water Quality and Air Quality resource concerns and other applicable resource concerns and provides for opportunities to manage nutrients for plant production and address offsite movement of nutrients. The design may include recommendations for associated conservation practices which address other related resource concerns. Meets the basic quality criteria for the DIA 157 as cited in the NRCS Field Office Technical Guide and CPS 590 Nutrient Management.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $5,425.50

Scenario Cost/Unit: $5,425.50

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$108.51	50	$5,425.50

Practice: 157 - Nutrient Management Design and Implementation Activity

Scenario: #53 - Design Nutrient Management for less than or equal to 100 Acres Fertilizer and Manure

Scenario Description:

Various on-farm land uses where natural or artificial amendments are applied. Natural Resource Concern: Water Quality, Soil Erosion, Water Quantity, and other associated resource concerns. Manure may be imported.

Before Situation:

Agricultural producer has no plan or minimal knowledge for the application and management of nutrients. The producer currently manages nutrient application based upon personal knowledge, or other local criteria. Producer is interested in management of nutrients to maximize yields, improve profit margins, reduce costs, and for environmental benefit. Producer is willing to collaborate with a certified TSP to develop a plan.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Nutrient Management conservation activity plan consistent with the criteria in DIA 157 and 590 Nutrient Management. The DIA criteria requires the plan to meet quality criteria for Soils, Water Quality and Air Quality resource concerns and other applicable resource concerns and provides for opportunities to manage nutrients for plant production and address offsite movement of nutrients. The design may include recommendations for associated conservation practices which address other related resource concerns. Meets the basic quality criteria for the DIA 157 as cited in the NRCS Field Office Technical Guide and CPS 590 Nutrient Management.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $5,425.50

Scenario Cost/Unit: $5,425.50

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$108.51	50	$5,425.50

Practice: 157 - Nutrient Management Design and Implementation Activity

Scenario: #69 - Design Nutrient Management for less than or equal to 100 Acres and No Manure

Scenario Description:
Various on-farm land uses where natural or artificial amendments are applied. Natural Resource Concern: Water Quality, Soil Erosion, Water Quantity, and other associated resource concerns.

Before Situation:
Agricultural producer has no plan or minimal knowledge for the application and management of nutrients. The producer currently manages nutrient application based upon personal knowledge, or other local criteria. Producer is interested in management of nutrients to maximize yields, improve profit margins, reduce costs, and for environmental benefit. Producer is willing to collaborate with a certified TSP to develop a plan.

After Situation:
After EQIP contract approval, participant has obtained services from a certified TSP for development of the Nutrient Management conservation activity plan consistent with the criteria in DIA 157 and 590 Nutrient Management. The DIA criteria requires the plan to meet quality criteria for Soils, Water Quality and Air Quality resource concerns and other applicable resource concerns and provides for opportunities to manage nutrients for plant production and address offsite movement of nutrients. The design may include recommendations for associated conservation practices which address other related resource concerns. Meets the basic quality criteria for the DIA 157 as cited in the NRCS Field Office Technical Guide and CPS 590 Nutrient Management.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $3,255.30

Scenario Cost/Unit: $3,255.30

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$108.51	30	$3,255.30

Practice: 157 - Nutrient Management Design and Implementation Activity

Scenario: #85 - Design Nutrient Management for greater than 300 Acres Fertilizer and Manure

Scenario Description:
Various on-farm land uses where natural or artificial amendments are applied. Natural Resource Concern: Water Quality, Soil Erosion, Water Quantity, and other associated resource concerns. Manure may be imported.

Before Situation:
Agricultural producer has no plan or minimal knowledge for the application and management of nutrients. The producer currently manages nutrient application based upon personal knowledge, or other local criteria. Producer is interested in management of nutrients to maximize yields, improve profit margins, reduce costs, and for environmental benefit. Producer is willing to collaborate with a certified TSP to develop a plan.

After Situation:
After EQIP contract approval, participant has obtained services from a certified TSP for development of the Nutrient Management conservation activity plan consistent with the criteria in DIA 157 and 590 Nutrient Management. The DIA criteria requires the plan to meet quality criteria for Soils, Water Quality and Air Quality resource concerns and other applicable resource concerns and provides for opportunities to manage nutrients for plant production and address offsite movement of nutrients. The design may include recommendations for associated conservation practices which address other related resource concerns. Meets the basic quality criteria for the DIA 157 as cited in the NRCS Field Office Technical Guide and CPS 590 Nutrient Management.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $9,223.35

Scenario Cost/Unit: $9,223.35

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$108.51	85	$9,223.35

Practice: 158 - Feed Management Design

Scenario: #5 - Feed Management Plan

Scenario Description:

The owner/operator of an Animal Feeding Operation (AFO) has not received a written Feed Management Plan that addresses all resource concerns present on the facility. Various levels of management and conservation implementation has occurred in the operation. Little documentation of the methods of feed management used and practices installed exists, and the producer is not likely to developed a complete forage inventory or nutrient analysis. The producer may or may not have a conservation plan or a nutrient management plan. Nutrient management related resource concerns on the operation remain to be addressed through the development of a complete activity plan including management and conservation practices for proper quantity and quality of available nutrients, feedstuffs, and/or additives fed to livestock or poultry that may be present on the operation. Present operation and feed methodology poses risk of feeding excessive amounts of nutrients in animal manure which result in negative impacts to water quality and odor resource concerns. Negative water and air quality impacts as well as farmstead safety and security issues may remain on the AFO, and inadequate record-keeping nutrient, inspection and monitoring of the existing operation may need further improvement.

Before Situation:

Producer does not have a plan or has limited knowledge of management of feed, nutrients, feedstuffs, or nutritional additives provided to domestic livestock and poultry. The producer currently manages feed without a plan which would address livestock production limitations and water and air quality resource concern impacts. Producer currently lacks plan to provide proper balance of forage, grains or other feeds and supplements to assure domestic animal nutritional needs are met without negatively impacting water and air quality. Producer is interested in management of feed for domestic animals to maximize profit margin, reduce costs, improve or address livestock production opportunities, and for other environmental benefits. Producer is willing to collaborate with a certified Technical Service Provider (TSP) to develop a plan, and to collect/coordinate data and records to determine current nutritional needs. Associated Practice(s): 590-Nutrient Management

After Situation:

Participant has obtained services from a certified TSP for development of the Feed Management plan (CAP). The criteria requires the plan to meet quality criteria for applicable natural resource concerns and provides for opportunities to identify and implement conservation practices related to management of feed, forages, or delivery of supplements to maximize efficient feeding operations and livestock growth. The plan may serve as the basis for implementation of the primary conservation practice 592 - Feed Management. If applicable, the plan may also be developed to complement Comprehensive Nutrient Management Plans (CNMP) or to help meet requirements of NRCS practice standard 590 - Nutrient Management. The plan may include recommendations for addressing associated natural resource concerns with other conservation practices.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $4,340.40

Scenario Cost/Unit: $4,340.40

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$108.51	40	$4,340.40

Practice: 159 - Grazing Management Design

Scenario: #101 - Design and Implementation Activities for Grazed Lands <100 acres

Scenario Description:
Design and implementation activities for agricultural operation with less than 100 acres grazed land. The following natural resource concerns will be addressed: Soil erosion, water quality, fish and wildlife, plant condition, and all other appropriate resource concerns.

Before Situation:
Producer has no plan or limited knowledge of conservation practices to effectively manage livestock or other animals on grazed land resources. The producer currently manages animals without a plan or implemented conservation practices to address identified natural resource concerns. Producer is interested in management of animals and implementing conservation practices to maximize profit margins, reduce costs, improve or address wildlife opportunities, and for other environmental benefit. Producer is willing to collaborate with a certified TSP to design and implement a plan and/or conservation practices to meet resource concerns. In addition to the Prescribed Grazing Plan (CPS 528) practice, other associated conservation practices standards maybe designed and implemented to meet resource concerns identified in the Conservation Planning Activity (CPA) for grazed lands.

After Situation:
After EQIP contract approval, participant has obtained services from a certified TSP for development of the Grazing Management DIA. The DIA criteria requires the design and implementation of grazing activities as a component of the CPA to address resouce concerns and to meet criteria for applicable conservation practices including practices such as: Prescribed Grazing Management (528), Brush Management (314), Fencing (382), Forage Harvest Management (511), Grazing Land Mechanical Treatment (548), Herbaceous Weed Treatment (315), Pasture and Hay Planting (512), Range Planting (550), and any additional conservation practices which address other related resource concerns. The DIA meets the basic quality criteria for the 159 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: 1

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $1,672.64

Scenario Cost/Unit: $1,672.64

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, range conservation	1299	Conservation Activity Plan labor to study, plan the use and management of rangelands to maximize their use in a sustainable manner. Range managers may inventory soils, plants, and animals; develop resource management plans; identify monitoring methods and collect data using those methods to determine if resource management objectives are being met or if adjustments to management activities are needed. For example, they may help ranchers attain optimum livestock production by determining the number and kind of animals to graze, the grazing system to use, and the best season for grazing. Cost associated with this component includes overhead and benefits (market price).	Hours	$104.54	16	$1,672.64

Practice: 159 - Grazing Management Design

Scenario: #117 - Design and Implementation Activities for Grazed Lands 101 to 500 acres

Scenario Description:
Design and implementation activities for an agricultural operation with 101 to 500 acres grazed land. The following natural resource concerns will be addressed: soil erosion, water quality, fish and wildlife, plant condition, and all other appropriate resource concerns.

Before Situation:
Producer has no plan or limited knowledge of conservation practices to effectively manage livestock or other animals on grazed land resources. The producer currently manages animals without a plan or implemented conservation practices to address identified natural resource concerns. Producer is interested in management of animals and implementing conservation practices to maximize profit margins, reduce costs, improve or address wildlife opportunities, and for other environmental benefit. Producer is willing to collaborate with a certified TSP to design and implement a plan and/or conservation practices to meet resource concerns. In addition to the Prescribed Grazing Plan (CPS 528) practice, other associated conservation practices standards maybe designed and implemented to meet resource concerns identified in the Conservation Planning Activity (CPA) for grazed lands.

After Situation:
After EQIP contract approval, participant has obtained services from a certified TSP for development of the Grazing Management DIA. The DIA criteria requires the design and implementation of grazing activities as a component of the CPA to address resouce concerns and to meet criteria for applicable conservation practices including practices such as: Prescribed Grazing Management (528), Brush Management (314), Fencing (382), Forage Harvest Management (511), Grazing Land Mechanical Treatment (548), Herbaceous Weed Treatment (315), Pasture and Hay Planting (512), Range Planting (550), and any additional conservation practices which address other related resource concerns. The DIA meets the basic quality criteria for the 159 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: 1

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $2,090.80

Scenario Cost/Unit: $2,090.80

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, range conservation	1299	Conservation Activity Plan labor to study, plan the use and management of rangelands to maximize their use in a sustainable manner. Range managers may inventory soils, plants, and animals; develop resource management plans; identify monitoring methods and collect data using those methods to determine if resource management objectives are being met or if adjustments to management activities are needed. For example, they may help ranchers attain optimum livestock production by determining the number and kind of animals to graze, the grazing system to use, and the best season for grazing. Cost associated with this component includes overhead and benefits (market price).	Hours	$104.54	20	$2,090.80

Practice: 159 - Grazing Management Design

Scenario: #133 - Design and Implementation Activities for Grazed Lands 501 to 1,500 acres

Scenario Description:
Design and implementation activities for agricultural operation with 501 to 1,500 acres grazed land. The following natural resource concerns will be addressed: soil erosion, water quality, fish and wildlife, plant condition, and all other appropriate resource concerns.

Before Situation:
Producer has no plan or limited knowledge of conservation practices to effectively manage livestock or other animals on grazed land resources. The producer currently manages animals without a plan or implemented conservation practices to address identified natural resource concerns. Producer is interested in management of animals and implementing conservation practices to maximize profit margins, reduce costs, improve or address wildlife opportunities, and for other environmental benefit. Producer is willing to collaborate with a certified TSP to design and implement a plan and/or conservation practices to meet resource concerns. In addition to the Prescribed Grazing Plan (CPS 528) practice, other associated conservation practices standards maybe designed and implemented to meet resource concerns identified in the Conservation Planning Activity (CPA) for grazed lands.

After Situation:
After EQIP contract approval, participant has obtained services from a certified TSP for development of the Grazing Management DIA. The DIA criteria requires the design and implementation of grazing activities as a component of the CPA to address resource concerns and to meet criteria for applicable conservation practices including practices such as: Prescribed Grazing Management (528), Brush Management (314), Fencing (382), Forage Harvest Management (511), Grazing Land Mechanical Treatment (548), Herbaceous Weed Treatment (315), Pasture and Hay Planting (512), Range Planting (550), and any additional conservation practices which address other related resource concerns. The DIA meets the basic quality criteria for the 159 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: 1

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $2,508.96

Scenario Cost/Unit: $2,508.96

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, range conservation	1299	Conservation Activity Plan labor to study, plan the use and management of rangelands to maximize their use in a sustainable manner. Range managers may inventory soils, plants, and animals; develop resource management plans; identify monitoring methods and collect data using those methods to determine if resource management objectives are being met or if adjustments to management activities are needed. For example, they may help ranchers attain optimum livestock production by determining the number and kind of animals to graze, the grazing system to use, and the best season for grazing. Cost associated with this component includes overhead and benefits (market price).	Hours	$104.54	24	$2,508.96

Practice: 159 - Grazing Management Design

Scenario: #149 - Design and Implementation Activities for Grazed Lands 1,501 to 5,000 acres

Scenario Description:
Design and implementation activity for an agricultural operation with 1,501 to 5,000 acres grazed land. The following natural resource concerns will be addressed: Soil erosion, water quality, fish and wildlife, plant condition, and all other appropriate resource concerns.

Before Situation:
Producer has no plan or limited knowledge of conservation practices to effectively manage livestock or other animals on grazed land resources. The producer currently manages animals without a plan or implemented conservation practices to address identified natural resource concerns. Producer is interested in management of animals and implementing conservation practices to maximize profit margins, reduce costs, improve or address wildlife opportunities, and for other environmental benefit. Producer is willing to collaborate with a certified TSP to design and implement a plan and/or conservation practices to meet resource concerns. In addition to the Prescribed Grazing Plan (CPS 528) practice, other associated conservation practices standards maybe designed and implemented to meet resource concerns identified in the Conservation Planning Activity (CPA) for grazed lands.

After Situation:
After EQIP contract approval, participant has obtained services from a certified TSP for development of the Grazing Management DIA. The DIA criteria requires the design and implementation of grazing activities as a component of the CPA to address resource concerns and to meet criteria for applicable conservation practices including practices such as: Prescribed Grazing Management (528), Brush Management (314), Fencing (382), Forage Harvest Management (511), Grazing Land Mechanical Treatment (548), Herbaceous Weed Treatment (315), Pasture and Hay Planting (512), Range Planting (550), and any additional conservation practices which address other related resource concerns. The DIA meets the basic quality criteria for the 159 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: 1

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $2,927.12

Scenario Cost/Unit: $2,927.12

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, range conservation	1299	Conservation Activity Plan labor to study, plan the use and management of rangelands to maximize their use in a sustainable manner. Range managers may inventory soils, plants, and animals; develop resource management plans; identify monitoring methods and collect data using those methods to determine if resource management objectives are being met or if adjustments to management activities are needed. For example, they may help ranchers attain optimum livestock production by determining the number and kind of animals to graze, the grazing system to use, and the best season for grazing. Cost associated with this component includes overhead and benefits (market price).	Hours	$104.54	28	$2,927.12

Practice: 159 - Grazing Management Design

Scenario: #165 - Design and Implementation Activities for Grazed Lands 5,001 to 10,000 acres

Scenario Description:
Design and implementation activities for an agricultural operation with 5,001 to 10,000 acres grazed land. The following natural resource concerns will be addressed: soil erosion, water quality, fish and wildlife, plant condition, and all other appropriate resource concerns.

Before Situation:
Producer has no plan or limited knowledge of conservation practices to effectively manage livestock or other animals on grazed land resources. The producer currently manages animals without a plan or implemented conservation practices to address identified natural resource concerns. Producer is interested in management of animals and implementing conservation practices to maximize profit margins, reduce costs, improve or address wildlife opportunities, and for other environmental benefit. Producer is willing to collaborate with a certified TSP to design and implement a plan and/or conservation practices to meet resource concerns. In addition to the Prescribed Grazing Plan (CPS 528) practice, other associated conservation practices standards maybe designed and implemented to meet resource concerns identified in the Conservation Planning Activity (CPA) for grazed lands.

After Situation:
After EQIP contract approval, participant has obtained services from a certified TSP for development of the Grazing Management DIA. The DIA criteria requires the design and implementation of grazing activities as a component of the CPA to address resouce concerns and to meet criteria for applicable conservation practices including practices such as: Prescribed Grazing Management (528), Brush Management (314), Fencing (382), Forage Harvest Management (511), Grazing Land Mechanical Treatment (548), Herbaceous Weed Treatment (315), Pasture and Hay Planting (512), Range Planting (550), and any additional conservation practices which address other related resource concerns. The DIA meets the basic quality criteria for the 159 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: 1

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $3,345.28

Scenario Cost/Unit: $3,345.28

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, range conservation	1299	Conservation Activity Plan labor to study, plan the use and management of rangelands to maximize their use in a sustainable manner. Range managers may inventory soils, plants, and animals; develop resource management plans; identify monitoring methods and collect data using those methods to determine if resource management objectives are being met or if adjustments to management activities are needed. For example, they may help ranchers attain optimum livestock production by determining the number and kind of animals to graze, the grazing system to use, and the best season for grazing. Cost associated with this component includes overhead and benefits (market price).	Hours	$104.54	32	$3,345.28

Practice: 159 - Grazing Management Design

Scenario: #181 - Design and Implementation Activities for Grazed Lands >10,000 acres

Scenario Description:
Design and implementation activities for an agricultural operation with greater than 10,000 acres grazed land. The following natural resource concerns will be addressed: soil erosion, water quality, fish and wildlife, plant condition, and all other appropriate resource concerns.

Before Situation:
Producer has no plan or limited knowledge of conservation practices to effectively manage livestock or other animals on grazed land resources. The producer currently manages animals without a plan or implemented conservation practices to address identified natural resource concerns. Producer is interested in management of animals and implementing conservation practices to maximize profit margins, reduce costs, improve or address wildlife opportunities, and for other environmental benefit. Producer is willing to collaborate with a certified TSP to design and implement a plan and/or conservation practices to meet resource concerns. In addition to the Prescribed Grazing Plan (CPS 528) practice, other associated conservation practices standards maybe designed and implemented to meet resource concerns identified in the Conservation Planning Activity (CPA) for grazed lands.

After Situation:
After EQIP contract approval, participant has obtained services from a certified TSP for development of the Grazing Management DIA. The DIA criteria requires the design and implementation of grazing activities as a component of the CPA to address resource concerns and to meet criteria for applicable conservation practices including practices such as: Prescribed Grazing Management (528), Brush Management (314), Fencing (382), Forage Harvest Management (511), Grazing Land Mechanical Treatment (548), Herbaceous Weed Treatment (315), Pasture and Hay Planting (512), Range Planting (550), and any additional conservation practices which address other related resource concerns. The DIA meets the basic quality criteria for the 159 plan as cited in the NRCS Field Office Technical Guide.

Feature Measure: 1

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $3,763.44

Scenario Cost/Unit: $3,763.44

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, range conservation	1299	Conservation Activity Plan labor to study, plan the use and management of rangelands to maximize their use in a sustainable manner. Range managers may inventory soils, plants, and animals; develop resource management plans; identify monitoring methods and collect data using those methods to determine if resource management objectives are being met or if adjustments to management activities are needed. For example, they may help ranchers attain optimum livestock production by determining the number and kind of animals to graze, the grazing system to use, and the best season for grazing. Cost associated with this component includes overhead and benefits (market price).	Hours	$104.54	36	$3,763.44

Practice: 160 - Prescribed Burning Design

Scenario: #5 - Prescribed Burning Plan DIA less than or equal to 20 acres

Scenario Description:

Non Industrial Private Forest Land, Pasture or Range Land typically less than or equal to 20 acres in size and is dominated by fire tolerant species that are competing with undesirable vegetation and accumulating fuel load. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition.

Before Situation:

Producer has no existing plan or an obsolete plan that is insufficient for current stand condition. A Prescribed Burning Plan or DIA is needed to enable the producer to apply for financial assistance through EQIP or other financial assistance programs in order to implement needed conservation practices. Associated Practices: 394, 383, 384, 528, 314, 315, 550, 644, 645, 659, 342, 647, 460, 643, 666, 595

After Situation:

After EQIP contract approval, participant has obtained services from a certified Technical Service Provider (TSP) for development of the Prescribed Burning DIA. The DIA criteria require the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Prescribed Burning Plan DIA is not considered a Forest Management Plan, a Reforestation Plan, a Forest Harvest Plan, or a Prescribed Grazing Plan, but should complement the needs of those plans if they exist and if desired by the decision maker. The DIA plan will fully describe all aspects of the prescribed burn including, but not limited to objectives of the burn (i.e., site preparation, wildlife habitat, etc.), site conditions (i.e., fuel load, fuel type, etc.), implementation strategies (i.e., method of ignition, number of persons required, equipment needs, etc.), tolerable weather parameters (i.e., wind direction, relative humidity, mixing height, etc.) and identification of Smoke Sensitive Areas. Additional DIA plan criteria are detailed in the Field Office Technical Guide and potentially state developed technical criteria.

Feature Measure: 1

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $1,268.85

Scenario Cost/Unit: $1,268.85

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, forester	1302	Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage.	Hours	$84.59	15	$1,268.85

Practice: 160 - Prescribed Burning Design

Scenario: #21 - Prescribed Burning Plan (DIA) greater than 1,000 acres

Scenario Description:

Non Industrial Private Forest Land, Pasture or Range Land typically greater than 1,000 acres in size and is dominated by fire tolerant species that are competing with undesirable vegetation and accumulating fuel load. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition.

Before Situation:

Producer has no existing plan or an obsolete plan that is insufficient for current stand condition. A Prescribed Burning Plan or DIA is needed to enable the producer to apply for financial assistance through EQIP or other financial assistance programs in order to implement needed conservation practices. Associated Practices: 394, 383, 384, 528, 314, 315, 550, 644, 645, 659, 342, 647, 460, 643, 666, 595

After Situation:

After EQIP contract approval, participant has obtained services from a certified Technical Service Provider (TSP) for development of the Prescribed Burning Plan (DIA). The DIA criteria require the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Prescribed Burning Plan DIA is not considered a Forest Management Plan, a Reforestation Plan, a Forest Harvest Plan, or a Prescribed Grazing Plan, but should complement the needs of those plans if they exist and if desired by the decision maker. The DIA plan will fully describe all aspects of the prescribed burn including, but not limited to objectives of the burn (i.e., site preparation, wildlife habitat, etc.), site conditions (i.e., fuel load, fuel type, etc.), implementation strategies (i.e., method of ignition, number of persons required, equipment needs, etc.), tolerable weather parameters (i.e., wind direction, relative humidity, mixing height, etc.) and identification of Smoke Sensitive Areas. Additional DIA plan criteria are detailed in the Field Office Technical Guide and potentially state developed technical criteria.

Feature Measure: 1

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $5,075.40

Scenario Cost/Unit: $5,075.40

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, forester	1302	Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage.	Hours	$84.59	60	$5,075.40

Practice: 160 - Prescribed Burning Design

Scenario: #37 - Prescribed Burning Plan-DIA greater than 501 acres and less than 1,000 acres

Scenario Description:

Non Industrial Private Forest Land, Pasture or Range Land typically greater than 501 acres and less than 1,000 acres in size and is dominated by fire tolerant species that are competing with undesirable vegetation and accumulating fuel load. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition.

Before Situation:

Producer has no existing plan or an obsolete plan that is insufficient for current stand condition. A Prescribed Burning Plan or DIA is needed to enable the producer to apply for financial assistance through EQIP or other financial assistance programs in order to implement needed conservation practices. Associated Practices: 394, 383, 384, 528, 314, 315, 550, 644, 645, 659, 342, 647, 460, 643, 666, 595

After Situation:

After EQIP contract approval, participant has obtained services from a certified Technical Service Provider (TSP) for development of the Prescribed Burning Plan DIA. The DIA criteria require the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Prescribed Burning Plan DIA is not considered a Forest Management Plan, a Reforestation Plan, a Forest Harvest Plan, or a Prescribed Grazing Plan, but should complement the needs of those plans if they exist and if desired by the decision maker. The DIA plan will fully describe all aspects of the prescribed burn including, but not limited to objectives of the burn (i.e., site preparation, wildlife habitat, etc.), site conditions (i.e., fuel load, fuel type, etc.), implementation strategies (i.e., method of ignition, number of persons required, equipment needs, etc.), tolerable weather parameters (i.e., wind direction, relative humidity, mixing height, etc.) and identification of Smoke Sensitive Areas. Additional DIA plan criteria are detailed in the Field Office Technical Guide and potentially state developed technical criteria.

Feature Measure: 1

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $3,383.60

Scenario Cost/Unit: $3,383.60

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, forester	1302	Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage.	Hours	$84.59	40	$3,383.60

Practice: 160 - Prescribed Burning Design

Scenario: #53 - Prescribed Burning Plan -DIA greater than 251 acres and less than 500 acres

Scenario Description:

Non Industrial Private Forest Land, Pasture or Range Land typically greater than 251 acres and less than 500 acres in size and is dominated by fire tolerant species that are competing with undesirable vegetation and accumulating fuel load. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition.

Before Situation:

Producer has no existing plan or an obsolete plan that is insufficient for current stand condition. A Prescribed Burning Plan or DIA is needed to enable the producer to apply for financial assistance through EQIP or other financial assistance programs in order to implement needed conservation practices. Associated Practices: 394, 383, 384, 528, 314, 315, 550, 644, 645, 659, 342, 647, 460, 643, 666, 595

After Situation:

After EQIP contract approval, participant has obtained services from a certified Technical Service Provider (TSP) for development of the Prescribed Burning Plan or DIA. The DIA criteria require the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Prescribed Burning Plan DIA is not considered a Forest Management Plan, a Reforestation Plan, a Forest Harvest Plan, or a Prescribed Grazing Plan, but should complement the needs of those plans if they exist and if desired by the decision maker. The DIA plan will fully describe all aspects of the prescribed burn including, but not limited to objectives of the burn (i.e., site preparation, wildlife habitat, etc.), site conditions (i.e., fuel load, fuel type, etc.), implementation strategies (i.e., method of ignition, number of persons required, equipment needs, etc.), tolerable weather parameters (i.e., wind direction, relative humidity, mixing height, etc.) and identification of Smoke Sensitive Areas. Additional DIA plan criteria are detailed in the Field Office Technical Guide and potentially state developed technical criteria.

Feature Measure: 1

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $2,537.70

Scenario Cost/Unit: $2,537.70

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, forester	1302	Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage.	Hours	$84.59	30	$2,537.70

Practice: 160 - Prescribed Burning Design

Scenario: #69 - Prescribed Burning Plan (DIA) greater than 101 acres and less than 250 acres

Scenario Description:

Non Industrial Private Forest Land, Pasture or Range Land typically greater that 101 acres in size and less than 250 acres and is dominated by fire tolerant species that are competing with undesirable vegetation and accumulating fuel load. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition.

Before Situation:

Producer has no existing plan or an obsolete plan that is insufficient for current stand condition. A Prescribed Burning Plan or DIA is needed to enable the producer to apply for financial assistance through EQIP or other financial assistance programs in order to implement needed conservation practices. Associated Practices: 394, 383, 384, 528, 314, 315, 550, 644, 645, 659, 342, 647, 460, 643, 666, 595

After Situation:

After EQIP contract approval, participant has obtained services from a certified Technical Service Provider (TSP) for development of the Prescribed Burning Plan DIA. The DIA criteria require the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Prescribed Burning Plan DIA is not considered a Forest Management Plan, a Reforestation Plan, a Forest Harvest Plan, or a Prescribed Grazing Plan, but should complement the needs of those plans if they exist and if desired by the decision maker. The DIA plan will fully describe all aspects of the prescribed burn including, but not limited to objectives of the burn (i.e., site preparation, wildlife habitat, etc.), site conditions (i.e., fuel load, fuel type, etc.), implementation strategies (i.e., method of ignition, number of persons required, equipment needs, etc.), tolerable weather parameters (i.e., wind direction, relative humidity, mixing height, etc.) and identification of Smoke Sensitive Areas. Additional DIA plan criteria are detailed in the Field Office Technical Guide and potentially state developed technical criteria.

Feature Measure: 1

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $2,114.75

Scenario Cost/Unit: $2,114.75

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, forester	1302	Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage.	Hours	$84.59	25	$2,114.75

Practice: 160 - Prescribed Burning Design

Scenario: #85 - Prescribed Burning Plan (DIA) greater than 21 acres and less than 100 acres

Scenario Description:

Non Industrial Private Forest Land, Pasture or Range Land typically greater than 21 acres and less than 100 acres in size and is dominated by fire tolerant species that are competing with undesirable vegetation and accumulating fuel load. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition.

Before Situation:

Producer has no existing plan or an obsolete plan that is insufficient for current stand condition. A Prescribed Burning Plan or DIA is needed to enable the producer to apply for financial assistance through EQIP or other financial assistance programs in order to implement needed conservation practices. Associated Practices: 394, 383, 384, 528, 314, 315, 550, 644, 645, 659, 342, 647, 460, 643, 666, 595

After Situation:

After EQIP contract approval, participant has obtained services from a certified Technical Service Provider (TSP) for development of the Prescribed Burning Plan or DIA. The DIA criteria require the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Prescribed Burning Plan DIA is not considered a Forest Management Plan, a Reforestation Plan, a Forest Harvest Plan, or a Prescribed Grazing Plan, but should complement the needs of those plans if they exist and if desired by the decision maker. The DIA plan will fully describe all aspects of the prescribed burn including, but not limited to objectives of the burn (i.e., site preparation, wildlife habitat, etc.), site conditions (i.e., fuel load, fuel type, etc.), implementation strategies (i.e., method of ignition, number of persons required, equipment needs, etc.), tolerable weather parameters (i.e., wind direction, relative humidity, mixing height, etc.) and identification of Smoke Sensitive Areas. Additional DIA plan criteria are detailed in the Field Office Technical Guide and potentially state developed technical criteria.

Feature Measure: 1

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $1,691.80

Scenario Cost/Unit: $1,691.80

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, forester	1302	Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage.	Hours	$84.59	20	$1,691.80

Practice: 161 - Pest Management Conservation System Design

Scenario: #5 - High Complexity, 5+ CPS

Scenario Description:

Agricultural operation where producer will implement high complexity conservation practices and PAMS activities as part of an overall Pest Management Conservation System. Natural resources relating to CPS 595 Pest Management Conservation System will be addressed. Will address resource concerns with 5 or more, high complexity conservation practices and/or PAMS activities.

Before Situation:

Agricultural operation currently managed using few pest management strategies. The producer will collaborate with a certified TSP to develop implementation requirements and/or designs and specifications for all conservation practices and PAMS activities to address resource concerns. High complexity conservation practices may include: prescribed grazing, irrigation water management, diverse conservation plantings and complex practices for such as Agrichemical Handling Facility and Vegetated Treatment Area . High Complexity PAMS activities include: field sanitation , intensive scouting etc.

After Situation:

After NRCS program contract is approved, participant will obtain services from a certified TSP to develop the required implementation requirements and/or designs and specifications for all conservation practices required to address resource concerns. All practices installed according to field office technical guide requirements. PAMS activities according to IPM plan and Land Grant University guidelines. Implementation requirements, designs and specifications all complete.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $8,409.84

Scenario Cost/Unit: $8,409.84

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$108.51	40	$4,340.40
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$85.82	40	$3,432.80
Cap Labor, Survey and Mapping Technician	1591	Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. May verify accuracy and completeness of maps.	Hours	$62.48	8	$499.84
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$34.20	4	$136.80

Practice: 161 - Pest Management Conservation System Design

Scenario: #21 - High Complexity, 1 -4 CPS

Scenario Description:

Agricultural operation where producer will implement high complexity conservation practices and PAMS activities as part of an overall Pest Management Conservation System. Natural resources relating to CPS 595 Pest Management Conservation System will be addressed. Will address resource concerns with 1 - 4, high complexity conservation practices and/or PAMS activities.

Before Situation:

Agricultural operation currently managed using few pest management strategies. The producer will collaborate with a certified TSP to develop implementation requirements and/or designs and specifications for all conservation practices and PAMS activities to address resource concerns. High complexity conservation practices may include: prescribed grazing, irrigation water management, diverse conservation plantings and complex practices for such as Agrichemical Handling Facility and Vegetated Treatment Area . High Complexity PAMS activities include: field sanitation , intensive scouting etc.

After Situation:

After NRCS program contract is approved, participant will obtain services from a certified TSP to develop the required implementation requirements and/or designs and specifications for all conservation practices required to address resource concerns. All practices installed according to field office technical guide requirements. PAMS activities according to IPM plan and Land Grant University guidelines. Implementation requirements, designs and specifications all complete.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $6,821.00

Scenario Cost/Unit: $6,821.00

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$108.51	32	$3,472.32
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$85.82	32	$2,746.24
Cap Labor, Survey and Mapping Technician	1591	Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. May verify accuracy and completeness of maps.	Hours	$62.48	8	$499.84
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$34.20	3	$102.60

Practice: 161 - Pest Management Conservation System Design

Scenario: #37 - Low Complexity, 5+ CPS

Scenario Description:

Agricultural operation where producer will implement low complexity conservation practices and PAMS activities as part of an overall Pest Management Conservation System. Natural resources relating to CPS 595 Pest Management Conservation System will be addressed. Will address resource concerns with 5 or more, low complexity conservation practices.

Before Situation:

Agricultural operation currently managed using few pest management strategies. The producer will collaborate with a certified TSP to develop implementation requirements and/or designs and specifications for all conservation practices and PAMS activities to address resource concerns. Low complexity conservation practices may include: cover crop, crop rotation, reduced tillage, conservation plantings and minor structural practices for erosion control such as grass waterways and diversions. Low Complexity PAMS activities include: using pest resistant varieties, trap crops, scouting etc.

After Situation:

After NRCS program contract is approved, participant will obtain services from a certified TSP to develop the required implementation requirements and/or designs and specifications for all conservation practices required to address resource concerns. All practices installed according to field office technical guide requirements. PAMS activities according to IPM plan and Land Grant University guidelines. Implementation requirements, designs and specifications all complete.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $4,800.72

Scenario Cost/Unit: $4,800.72

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$108.51	24	$2,604.24
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$85.82	24	$2,059.68
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$34.20	4	$136.80

Practice: 161 - Pest Management Conservation System Design

Scenario: #53 - Low Complexity 1-4 CPS

Scenario Description:

Agricultural operation where producer will implement low complexity conservation practices and PAMS activities as part of an overall Pest Management Conservation System. Natural resources relating to CPS 595 Pest Management Conservation System will be addressed. Will address resource concerns with 1 - 4, low complexity conservation practices.

Before Situation:

Agricultural operation currently managed using few pest management strategies. The producer will collaborate with a certified TSP to develop implementation requirements and/or designs and specifications for all conservation practices and PAMS activities to address resource concerns. Low complexity conservation practices may include: cover crop, crop rotation, reduced tillage, conservation plantings and minor structural practices for erosion control such as grass waterways and diversions. Low Complexity PAMS activities include: using pest resistant varieties, trap crops, scouting etc.

After Situation:

After NRCS program contract is approved, participant will obtain services from a certified TSP to develop the required implementation requirements and/or designs and specifications for all conservation practices required to address resource concerns. All practices installed according to field office technical guide requirements. PAMS activities according to IPM plan and Land Grant University guidelines. Implementation requirements, designs and specifications all complete.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $3,211.88

Scenario Cost/Unit: $3,211.88

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$108.51	16	$1,736.16
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$85.82	16	$1,373.12
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$34.20	3	$102.60

Practice: 162 - Soil Health Management System Design

Scenario: #5 - Organic Crops + Livestock, <5

Scenario Description:

Evaluate soil health concerns and develop a transitional cropping management plan to improve overall soil health and address all 4 soil health principles. The plan includes management activities or land management practices associated with crop and forage production. The soil health management plan ensures that the purposes of crop and forage production and preservation of natural resources related to soil health are compatible. May simultaneously implement 216 Soil Health Testing CEMA to evaluate baseline soil health and inventory basic or additional soil health indicators. The plan is developed for up to 5 Soil Health Management Units (SHMU) for organic crops and livestock. A SHMU is 1 or more planning land units with similar soil type, land use, and management. A SHMU and can vary in size or acreage depending on soil texture, topography, and cropping system.

Before Situation:

Agricultural producer has been farming a system that has not addressed all 4 of the soil health principles. Producer has noticed yield declines, soil degradation, or is simply interested in learning more about soil health management. Producer has collaborated with a certified TSP to develop a written Soil Health Management Plan (116).

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Soil Health Management Plan consistent with the criteria in DIA 162. The DIA criteria requires the plan address all 4 soil health principles. Meets the planning criteria for DIA 162 and facilitating soil health practices as referenced in FOTG.

Feature Measure: each

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $6,944.64

Scenario Cost/Unit: $6,944.64

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$108.51	64	$6,944.64

Practice: 162 - Soil Health Management System Design

Scenario: #21 - Crops, 5 or more

Scenario Description:

Evaluate soil health concerns and develop a transitional cropping management plan to improve overall soil health and address all 4 soil health principles. The plan includes management activities or land management practices associated with crop and forage production. The soil health management plan ensures that the purposes of crop and forage production and preservation of natural resources related to soil health are compatible. May simultaneously implement 216 Soil Health Testing CEMA to evaluate baseline soil health and inventory basic or additional soil health indicators. The plan is developed for more than 5 Soil Health Management Units (SHMU) for crops. A SHMU is 1 or more planning land units with similar soil type, land use, and management. A SHMU can vary in size or acreage depending on soil texture, topography, and cropping system.

Before Situation:

Agricultural producer has been farming a system that has not addressed all 4 of the soil health principles. Producer has noticed yield declines, soil degradation, or is simply interested in learning more about soil health management. Producer has a written conservation plan including core soil health practices or has collaborated with a certified TSP to develop a written Soil Health Management Plan (CPA 116).

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Soil Health Management Plan consistent with the criteria in DIA 162. The DIA criteria requires the plan address all 4 soil health principles. Meets the planning criteria for DIA 162 and facilitating soil health practices as referenced in FOTG.

Feature Measure: each

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $4,991.46

Scenario Cost/Unit: $4,991.46

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$108.51	46	$4,991.46

Practice: 162 - Soil Health Management System Design

Scenario: #37 - Crops + Livestock, 5 or more

Scenario Description:

Evaluate soil health concerns and develop a transitional cropping management plan to improve overall soil health and address all 4 soil health principles. The plan includes management activities or land management practices associated with crop and forage production. The soil health management plan ensures that the purposes of crop and forage production and preservation of natural resources related to soil health are compatible. May simultaneously implement 216 Soil Health Testing CEMA to evaluate baseline soil health and inventory basic or additional soil health indicators. The plan is developed for 5 or more Soil Health Management Units (SHMU) for crops and livestock. A SHMU is 1 or more planning land units with similar soil type, land use, and management. A SHMU can vary in size or acreage depending on soil texture, topography, and cropping system.

Before Situation:

Agricultural producer has been farming a system that has not addressed all 4 of the soil health principles. Producer has noticed yield declines, soil degradation, or is simply interested in learning more about soil health management. Producer has a written conservation plan including core soil health practices or has collaborated with a certified TSP to develop a written Soil Health Management Plan (CPA 116).

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Soil Health Management Plan consistent with the criteria in DIA 162. The DIA criteria requires the plan address all 4 soil health principles. Meets the planning criteria for DIA 162 and facilitating soil health practices as referenced in FOTG.

Feature Measure: each

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $5,425.50

Scenario Cost/Unit: $5,425.50

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$108.51	50	$5,425.50

Practice: 162 - Soil Health Management System Design

Scenario: #53 - Small Farm

Scenario Description:

Evaluate soil health concerns and develop a transitional cropping management plan to improve overall soil health and address all 4 soil health principles. The plan includes management activities or land management practices associated with crop and forage production. The soil health management plan ensures that the purposes of crop and forage production and preservation of natural resources related to soil health are compatible. May simultaneously implement 216 Soil Health Testing CEMA to evaluate baseline soil health and inventory basic or additional soil health indicators. The plan is developed for a small farm operation of less than 10 acres.

Before Situation:

Agricultural producer has been farming a system that has not addressed all 4 of the soil health principles. Producer has noticed yield declines, soil degradation, or is simply interested in learning more about soil health management. Producer has collaborated with a certified TSP to develop a written Soil Health Management Plan (116).

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Soil Health Management Plan consistent with the criteria in DIA 162. The DIA criteria requires the plan address all 4 soil health principles. Meets the planning criteria for DIA 162 and facilitating soil health practices as referenced in FOTG.

Feature Measure: each

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $3,255.30

Scenario Cost/Unit: $3,255.30

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$108.51	30	$3,255.30

Practice: 162 - Soil Health Management System Design

Scenario: #69 - Crops, <5

Scenario Description:

Evaluate soil health concerns and develop a transitional cropping management plan to improve overall soil health and address all 4 soil health principles. The plan includes management activities or land management practices associated with crop and forage production. The soil health management plan ensures that the purposes of crop and forage production and preservation of natural resources related to soil health are compatible. May simultaneously implement 216 Soil Health Testing CEMA to evaluate baseline soil health and inventory basic or additional soil health indicators. The plan is developed for fewer than 5 Soil Health Management Units (SHMU) for crops. A SHMU is 1 or more planning land units with similar soil type, land use, and management. A SHMU and can vary in size or acreage depending on soil texture, topography, and cropping system.

Before Situation:

Agricultural producer has been farming a system that has not addressed all 4 of the soil health principles. Producer has noticed yield declines, soil degradation, or is simply interested in learning more about soil health management. Producer has collaborated with a certified TSP to develop a written Soil Health Management Plan (116).

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Soil Health Management Plan consistent with the criteria in DIA 162. The DIA criteria requires the plan address all 4 soil health principles. Meets the planning criteria for DIA 162 and facilitating soil health practices as referenced in FOTG.

Feature Measure: each

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $4,123.38

Scenario Cost/Unit: $4,123.38

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$108.51	38	$4,123.38

Practice: 162 - Soil Health Management System Design

Scenario: #85 - Organic Crops, <5

Scenario Description:

Evaluate soil health concerns and develop a transitional cropping management plan to improve overall soil health and address all 4 soil health principles. The plan includes management activities or land management practices associated with crop and forage production. The soil health management plan ensures that the purposes of crop and forage production and preservation of natural resources related to soil health are compatible. May simultaneously implement 216 Soil Health Testing CEMA to evaluate baseline soil health and inventory basic or additional soil health indicators. The plan is developed for fewer than 5 Soil Health Management Units (SHMU) for organic crops. A SHMU is 1 or more planning land units with similar soil type, land use, and management. A SHMU and can vary in size or acreage depending on soil texture, topography, and cropping system.

Before Situation:

Agricultural producer has been farming a system that has not addressed all 4 of the soil health principles. Producer has noticed yield declines, soil degradation, or is simply interested in learning more about soil health management. Producer has collaborated with a certified TSP to develop a written Soil Health Management Plan (CPA 116).

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Soil Health Management Plan consistent with the criteria in DIA 162. The DIA criteria requires the plan address all 4 soil health principles. Meets the planning criteria for DIA 162 and facilitating soil health practices as referenced in FOTG.

Feature Measure: each

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $4,774.44

Scenario Cost/Unit: $4,774.44

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$108.51	44	$4,774.44

Practice: 162 - Soil Health Management System Design

Scenario: #101 - Crops + Livestock, <5

Scenario Description:

Evaluate soil health concerns and develop a transitional cropping management plan to improve overall soil health and address all 4 soil health principles. The plan includes management activities or land management practices associated with crop and forage production. The soil health management plan ensures that the purposes of crop and forage production and preservation of natural resources related to soil health are compatible. May simultaneously implement 216 Soil Health Testing CEMA to evaluate baseline soil health and inventory basic or additional soil health indicators. The plan is developed for fewer than 5 Soil Health Management Units (SHMU) for crops and livestock. A SHMU is 1 or more planning land units with similar soil type, land use, and management. A SHMU can vary in size or acreage depending on soil texture, topography, and cropping system.

Before Situation:

Agricultural producer has been farming a system that has not addressed all 4 of the soil health principles. Producer has noticed yield declines, soil degradation, or is simply interested in learning more about soil health management. Producer has a written conservation plan including core soil health practices or has collaborated with a certified TSP to develop a written Soil Health Management Plan (CPA 116).

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Soil Health Management Plan consistent with the criteria in DIA 162. The DIA criteria requires the plan address all 4 soil health principles. Meets the planning criteria for DIA 162 and facilitating soil health practices as referenced in FOTG.

Feature Measure: each

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $4,340.40

Scenario Cost/Unit: $4,340.40

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$108.51	40	$4,340.40

Practice: 162 - Soil Health Management System Design

Scenario: #117 - Organic Crops, 5 or more

Scenario Description:

Evaluate soil health concerns and develop a transitional cropping management plan to improve overall soil health and address all 4 soil health principles. The plan includes management activities or land management practices associated with crop and forage production. The soil health management plan ensures that the purposes of crop and forage production and preservation of natural resources related to soil health are compatible. May simultaneously implement 216 Soil Health Testing CEMA to evaluate baseline soil health and inventory basic or additional soil health indicators. The plan is developed for 5 or more Soil Health Management Units (SHMU) for organic crops. A SHMU is 1 or more planning land units with similar soil type, land use, and management. A SHMU can vary in size or acreage depending on soil texture, topography, and cropping system.

Before Situation:

Agricultural producer has been farming a system that has not addressed all 4 of the soil health principles. Producer has noticed yield declines, soil degradation, or is simply interested in learning more about soil health management. Producer has a written conservation plan including core soil health practices or has collaborated with a certified TSP to develop a written Soil Health Management Plan (CPA 116).

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Soil Health Management Plan consistent with the criteria in DIA 162. The DIA criteria requires the plan address all 4 soil health principles. Meets the planning criteria for DIA 162 and facilitating soil health practices as referenced in FOTG.

Feature Measure: each

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $6,510.60

Scenario Cost/Unit: $6,510.60

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$108.51	60	$6,510.60

Practice: 162 - Soil Health Management System Design

Scenario: #133 - Organic Crops + Livestock, 5 or more

Scenario Description:

Evaluate soil health concerns and develop a transitional cropping management plan to improve overall soil health and address all 4 soil health principles. The plan includes management activities or land management practices associated with crop and forage production. The soil health management plan ensures that the purposes of crop and forage production and preservation of natural resources related to soil health are compatible. May simultaneously implement 216 Soil Health Testing CEMA to evaluate baseline soil health and inventory basic or additional soil health indicators. The plan is developed for 5 or more Soil Health Management Units (SHMU) for organic crops and livestock. A SHMU is 1 or more planning land units with similar soil type, land use, and management. A SHMU can vary in size or acreage depending on soil texture, topography, and cropping system.

Before Situation:

Agricultural producer has been farming a system that has not addressed all 4 of the soil health principles. Producer has noticed yield declines, soil degradation, or is simply interested in learning more about soil health management. Producer has a written conservation plan including core soil health practices or has collaborated with a certified TSP to develop a written Soil Health Management Plan (CPA 116).

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Soil Health Management Plan consistent with the criteria in DIA 162. The DIA criteria requires the plan address all 4 soil health principles. Meets the planning criteria for DIA 162 and facilitating soil health practices as referenced in FOTG.

Feature Measure: each

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $8,680.80

Scenario Cost/Unit: $8,680.80

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$108.51	80	$8,680.80

Practice: 163 - Irrigation Water Management Design

Scenario: #5 - 1-2 Designs - Without Pump Test

Scenario Description:

An agricultural producer wishes to address irrigation water use inefficiency and all other appropriate resource concerns through an EQIP contract with at least one (1) irrigation practice scenario. The pump for the irrigation system is of known performance and less then 3 years old. Each 'Design' indicates that new devices or components is closely related to other devices or components of the irrigation water management system even if numerous practices are contracted. The Irrigation Water Management DIA includes reviewing, and when needed, revising alternatives to address the identified concern(s). The Irrigation Water Management DIA documents: a) the client???s final decisions related to the associated irrigation practice scenarios; and b) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern(s): Insufficient Water - Inefficient Irrigation Water Use; Water Quality Degradation - Excessive sediment in surface waters, Nutrients transported to surface and groundwater, pesticides transported to surface and groundwater, pathogens and chemicals from manure, and biosolids or compost applications transported to surface and groundwater, excess salts in surface and groundwater; Degraded Plant Condition - Undesirable plant productivity and health; Inefficient Energy Use - Equipment and facilities.

Before Situation:

Producer wants to improve irrigation water management on their agricultural operation to address insufficient water, water quality degradation, degraded plant condition, or inefficient energy use concerns. Producer intends to work with a certified TSP to develop designs to implement one or more practice scenarios to address identified resource concerns using the Irrigation Water Management DIA. The DIA 163 criteria incorporates recommended measures to address insufficient water, water quality degradation, degraded plant condition, or inefficient energy use concerns. Associated Practices: Code 449-Irrigation Water Management, Code 441-Irrigation System, Microirrigation, Code 442-Sprinkler System, Code 443-Irrigation System, Surface and Subsurface, Code 430-Irrigation Pipeline, Code 428-Irrigation Ditch Lining, Code 388-Irrigation Field Ditch, Code 320-Irrigation Canal or Lateral, Code 587-Structure for Water Control, Code 436-Irrigation Reservoir, Code 447-Irrigation and Drainage Tailwater Recovery, Code 533-Pumping Plant, Code 464-Irrigation Land Leveling, Code 450-Anionic Polyacrylamide (PAM) Application, Code 610-Saline and Sodic Soil Management, or other applicable practices in the NRCS Field Office Technical Guide.

After Situation:

The producer has obtained services from a certified TSP to develop practice scenario designs using the Irrigation Water Management DIA. The DIA 163 criteria include tasks needed to document the client???s decisions and design of conservation practices which address insufficient water, water quality degradation, degraded plant condition, or inefficient energy use. The Irrigation Water Management DIA meets the quality criteria for the DIA 164 activity as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $7,006.56

Scenario Cost/Unit: $7,006.56

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, small surveying crew	1296	Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. Cost associated with this component includes two man field crew, equipment, vehicle, overhead, and miscellaneous supplies.	Hours	$122.89	8	$983.12
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	40	$4,268.80
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$85.82	8	$686.56

Cap Labor, Survey and Mapping Technician	1591	Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. May verify accuracy and completeness of maps.	Hours	$62.48	16	$999.68
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$34.20	2	$68.40

Practice: 163 - Irrigation Water Management Design

Scenario: #21 - 3 or More Designs - Without Pump Test

Scenario Description:

An agricultural producer wishes to address irrigation water use inefficiency and all other appropriat resource concerns through an EQIP contract with multiple irrigation practice scenario. The pump for the irrigation system is of known performance and less then 3 years old. Each 'Design' indicates that new devices or components is closely related to other decives or components of the irrigation water management system even if numerous practices are contracted. The Irrigation Water Management DIA includes reviewing, and, when needed, revising alternatives to address the identified concern(s). The Irrigation Water Management DIA documents: a) the client???s final decisions related to the associated irrigation practice scenarios; and b) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern(s): Insufficient Water - Inefficient Irrigation Water Use; Water Quality Degradation - Excessive sediment in surface waters, Nutrients transported to surface and groundwater, pesticides transported to surface and groundwater, pathogens and chemicals from manure, and biosolids or compost applications transported to surface and groundwater, excess salts in surface and groundwater; Degraded Plant Condition - Undesirable plant productivity and health; Inefficient Energy Use - Equipment and facilities.

Before Situation:

Producer wants to improve irrigation water management on their agricultural operation to address insufficient water, water quality degradation, degraded plant condition, or inefficient energy use concerns. Producer intends to work with a certified TSP to develop designs to implement one or more practice scenarios to address identified resource concerns using the Irrigation Water Management DIA. The DIA 163 criteria incorporates recommended measures to address insufficient water, water quality degradation, degraded plant condition, or inefficient energy use concerns. Associated Practices: Associated Practices: Code 449-Irrigation Water Management, Code 441-Irrigation System, Microirrigation, Code 442-Sprinkler System, Code 443-Irrigation System, Surface and Subsurface, Code 430-Irrigation Pipeline, Code 428-Irrigation Ditch Lining, Code 388-Irrigation Field Ditch, Code 320-Irrigation Canal or Lateral, Code 587-Structure for Water Control, Code 436-Irrigation Reservoir, Code 447-Irrigation and Drainage Tailwater Recovery, Code 533-Pumping Plant, Code 464-Irrigation Land Leveling, Code 450-Anionic Polyacrylamide (PAM) Application, Code 610-Saline and Sodic Soil Management, or other applicable practices in the NRCS Field Office Technical Guide.

After Situation:

The producer has obtained services from a certified TSP to develop practice scenario designs using the Drainage Water Management DIA. The DIA 164 criteria include tasks needed to document the client???s decisions and design of conservation practices which address water quality, plant condition, or soil health. The Drainage Water Management DIA meets the quality criteria for the DIA 164 activity as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $11,417.64

Scenario Cost/Unit: $11,417.64

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, small surveying crew	1296	Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. Cost associated with this component includes two man field crew, equipment, vehicle, overhead, and miscellaneous supplies.	Hours	$122.89	16	$1,966.24
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	56	$5,976.32
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$85.82	16	$1,373.12

Cap Labor, Survey and Mapping Technician	1591	Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. May verify accuracy and completeness of maps.	Hours	$62.48	32	$1,999.36
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$34.20	3	$102.60

Practice: 163 - Irrigation Water Management Design

Scenario: #37 - 1-2 Designs - With Pump Test

Scenario Description:

An agricultural producer wishes to address irrigation water use inefficiency and all other appropriat resource concerns through an EQIP contract with multiple irrigation practice scenario through an EQIP contract with at least one (1) irrigation practice scenario. The pump for the irrigation system is of unknown performance and older than 3 years. Each 'Design' indicates that new devices or components is closely related to other devices or components of the irrigation water managment system even if numerous practices are contracted. The Irrigation Water Management DIA includes reviewing, and, when needed, revising alternatives to address the identified concern(s). The Irrigation Water Management DIA documents: a) the client???s final decisions related to the associated irrigation practice scenarios; and b) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern(s): Insufficient Water - Inefficient Irrigation Water Use; Water Quality Degradation - Excessive sediment in surface waters, Nutrients transported to surface and groundwater, pesticides transported to surface and groundwater, pathogens and chemicals from manure, and biosolids or compost applications transported to surface and groundwater, excess salts in surface and groundwater; Degraded Plant Condition - Undesirable plant productivity and health; Inefficient Energy Use - Equipment and facilities.

Before Situation:

Producer wants to improve irrigation water management on their agricultural operation to address insufficient water, water quality degradation, degraded plant condition, or inefficient energy use concerns. The pump for the irrigation system is of unknown performance and older than 3 years. Producer intends to work with a certified TSP to develop designs to implement one or more practice scenarios to address identified resource concerns using the Irrigation Water Management DIA. The DIA 163 criteria incorporates recommended measures to address insufficient water, water quality degradation, degraded plant condition, or inefficient energy use concerns. Associated Practices: Code 449-Irrigation Water Management, Code 441-Irrigation System, Microirrigation, Code 442-Sprinkler System, Code 443-Irrigation System, Surface and Subsurface, Code 430-Irrigation Pipeline, Code 428-Irrigation Ditch Lining, Code 388-Irrigation Field Ditch, Code 320-Irrigation Canal or Lateral, Code 587-Structure for Water Control, Code 436-Irrigation Reservoir, Code 447-Irrigation and Drainage Tailwater Recovery, Code 533-Pumping Plant, Code 464-Irrigation Land Leveling, Code 450-Anionic Polyacrylamide (PAM) Application, Code 610-Saline and Sodic Soil Management, or other applicable practices in the NRCS Field Office Technical Guide.

After Situation:

The producer has obtained services from a certified TSP to develop practice scenario designs using the Irrigation Water Management DIA. The DIA 163 criteria include tasks needed to document the client???s decisions and design of conservation practices which address address insufficient water, water quality degradation, degraded plant condition, or inefficient energy use. The Irrigation Water Management DIA meets the quality criteria for the DIA 163 activity as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $8,339.96

Scenario Cost/Unit: $8,339.96

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, small surveying crew	1296	Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. Cost associated with this component includes two man field crew, equipment, vehicle, overhead, and miscellaneous supplies.	Hours	$122.89	8	$983.12
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	48	$5,122.56
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$85.82	8	$686.56

Cap Labor, Survey and Mapping Technician	1591	Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. May verify accuracy and completeness of maps.	Hours	$62.48	16	$999.68
CAP Labor, Skilled	1604	Conservation Activity Plan labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$39.97	12	$479.64
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$34.20	2	$68.40

Practice: 163 - Irrigation Water Management Design

Scenario: #53 - 3 or More Designs - With Pump Test

Scenario Description:

An agricultural producer wishes to address irrigation water use inefficiency and all other appropriat resource concerns through an EQIP contract with multiple irrigation practice scenario through an EQIP contract with at least one (1) irrigation practice scenario. The pump for the irrigation system is of unknown performance and older than 3 years. Each 'Design' indicates that new devices or components is closely related to other devices or components of the irrigation water management system even if numerous practices are contracted. The Irrigation Water Management DIA includes reviewing, and, when needed, revising alternatives to address the identified concern(s). The Irrigation Water Management DIA documents: a) the client???s final decisions related to the associated irrigation practice scenarios; and b) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern(s): Insufficient Water - Inefficient Irrigation Water Use; Water Quality Degradation - Excessive sediment in surface waters, Nutrients transported to surface and groundwater, pesticides transported to surface and groundwater, pathogens and chemicals from manure, and biosolids or compost applications transported to surface and groundwater, excess salts in surface and groundwater; Degraded Plant Condition - Undesirable plant productivity and health; Inefficient Energy Use - Equipment and facilities.

Before Situation:

Producer wants to improve irrigation water management on their agricultureal operation to address insufficient water, water quality degradation, degraded plant condition, or inefficient energy use concerns. The pump for the irrigation system is of unknown performance and older than 3 years. Producer intends to work with a certified TSP to develop designs to implement one or more practice scenarios to address identified resource concerns using the Irrigation Water Management DIA. The DIA 163 criteria incorporates recommended measures toaddress insufficient water, water quality degradation, degraded plant condition, or inefficient energy use concerns. Associated Practices: Code 449-Irrigation Water Management, Code 441-Irrigation System, Microirrigation, Code 442-Sprinkler System, Code 443-Irrigation System, Surface and Subsurface, Code 430-Irrigation Pipeline, Code 428-Irrigation Ditch Lining, Code 388-Irrigation Field Ditch, Code 320-Irrigation Canal or Lateral, Code 587-Structure for Water Control, Code 436-Irrigation Reservoir, Code 447-Irrigation and Drainage Tailwater Recovery, Code 533-Pumping Plant, Code 464-Irrigation Land Leveling, Code 450-Anionic Polyacrylamide (PAM) Application, Code 610-Saline and Sodic Soil Management, or other applicable practices in the NRCS Field Office Technical Guide.

After Situation:

The producer has obtained services from a certified TSP to develop practice scenario designs using the Irrigation Water Management DIA. The DIA 163 criteria include tasks needed to document the client???s decisions and design of conservation practices which address insufficient water, water quality degradation, degraded plant condition, or inefficient energy use. The Irrigation Water Management DIA meets the quality criteria for the DIA 163 activity as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $13,230.68

Scenario Cost/Unit: $13,230.68

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, small surveying crew	1296	Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. Cost associated with this component includes two man field crew, equipment, vehicle, overhead, and miscellaneous supplies.	Hours	$122.89	16	$1,966.24
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	64	$6,830.08
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$85.82	16	$1,373.12

Cap Labor, Survey and Mapping Technician	1591	Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. May verify accuracy and completeness of maps.	Hours	$62.48	32	$1,999.36
CAP Labor, Skilled	1604	Conservation Activity Plan labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$39.97	24	$959.28
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$34.20	3	$102.60

Practice: 164 - Improved Management of Drainage Water Design

Scenario: #5 - 1-2 Designs - Tile Map Available

Scenario Description:

An agricultural producer wishes to address water quality degradation, poor plant productivity and health, and/or oxidation of organic matter in soils on a relatively flat crop field with a patterned drainage system through an EQIP contract with at least one (1) drainage practice scenario. A map of the tile system is available. Each 'Design??? indicates that each new device or component is closely related to other devices or components of the drainage water management system even if numerous practices are contracted. The Drainage Water Management DIA includes reviewing, and when needed, revising alternatives to address the identified concern(s). The Drainage Water Management DIA documents: a) the client???s final decisions related to the associated drainage practice scenarios; and b) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern(s): Water Quality - Excess nutrients in surface and groundwaters, Plant Condition - Plant Productivity and Health, and Soil Health - Subsidence.

Before Situation:

Producer wants to improve drainage water management on their agricultural operation to address water quality, plant condition, or soil health concerns. Producer intends to work with a certified TSP to develop designs to implement one or more practice scenarios to address identified resource concerns using the Drainage Water Management DIA. The DIA 164 criteria incorporates recommended measures to increase water quality, plant condition, or soil health. Associated Practices: 554-Drainage Water Management, 604-Saturated Buffer, 605-Denitrifying Bioreactor, 606-Subsurface Drain, 607-Surface Drain, Field Ditch, 608-Surface Drain, Main or Lateral, 587-Structure for Water Control, 590-Nutrient Management, 340-Cover Crop, or other applicable practices in the NRCS Field Office Technical Guide.

After Situation:

The producer has obtained services from a certified TSP to develop practice scenario designs using the Drainage Water Management DIA. The DIA 164 criteria include tasks needed to document the client???s decisions and design of conservation practices which address water quality, plant condition, or soil health. The Drainage Water Management DIA meets the quality criteria for the DIA 164 activity as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $6,839.36

Scenario Cost/Unit: $6,839.36

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, small surveying crew	1296	Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. Cost associated with this component includes two man field crew, equipment, vehicle, overhead, and miscellaneous supplies.	Hours	$122.89	8	$983.12
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	32	$3,415.04
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$85.82	16	$1,373.12
Cap Labor, Survey and Mapping Technician	1591	Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. May verify accuracy and completeness of maps.	Hours	$62.48	16	$999.68

CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$34.20	2	$68.40

Practice: 164 - Improved Management of Drainage Water Design

Scenario: #21 - 3 or More Designs - Tile Map Available

Scenario Description:

An agricultural producer wishes to address water quality degradation, poor plant productivity and health, and/or oxidation of organic matter in soils on a relatively flat crop field with a patterned drainage system through an EQIP contract with multiple drainage practice scenario. A map of the tile system is available. Each 'Design??? indicates that each new device or component is closely related to other devices or components of the drainage water management system even if numerous practices are contracted. The Drainage Water Management DIA includes reviewing, and when needed, revising alternatives to address the identified concern(s). The Drainage Water Management DIA documents: a) the client???s final decisions related to the associated drainage practice scenarios; and b) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern(s): Water Quality - Excess nutrients in surface and groundwaters, Plant Condition - Plant Productivity and Health, and Soil Health - Subsidence.

Before Situation:

Producer wants to improve drainage water management on their agricultural operation to address water quality, plant condition, or soil health concerns. Producer intends to work with a certified TSP to develop designs to implement one or more practice scenarios to address identified resource concerns using the Drainage Water Management DIA. The DIA 164 criteria incorporates recommended measures to increase water quality, plant condition, or soil health. Associated Practices: 554-Drainage Water Management, 604-Saturated Buffer, 605-Denitrifying Bioreactor, 606-Subsurface Drain, 607-Surface Drain, Field Ditch, 608-Surface Drain, Main or Lateral, 587-Structure for Water Control, 590-Nutrient Management, 340-Cover Crop, or other applicable practices in the NRCS Field Office Technical Guide.

After Situation:

The producer has obtained services from a certified TSP to develop practice scenario designs using the Drainage Water Management DIA. The DIA 164 criteria include tasks needed to document the client???s decisions and design of conservation practices which address water quality, plant condition, or soil health. The Drainage Water Management DIA meets the quality criteria for the DIA 164 activity as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $10,750.60

Scenario Cost/Unit: $10,750.60

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, small surveying crew	1296	Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. Cost associated with this component includes two man field crew, equipment, vehicle, overhead, and miscellaneous supplies.	Hours	$122.89	16	$1,966.24
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	48	$5,122.56
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$85.82	24	$2,059.68
Cap Labor, Survey and Mapping Technician	1591	Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. May verify accuracy and completeness of maps.	Hours	$62.48	24	$1,499.52

CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$34.20	3	$102.60

Practice: 164 - Improved Management of Drainage Water Design

Scenario: #37 - 1-2 Designs - No Tile Map Available

Scenario Description:

An agricultural producer wishes to address water quality degradation, poor plant productivity and health, and/or oxidation of organic matter in soils on a relatively flat crop field with a patterned drainage system through an EQIP contract with at least one (1) drainage practice scenario. A map of the tile system is not available. Each 'Design??? indicates that each new device or component is closely related to other devices or components of the drainage water management system even if numerous practices are contracted. The Drainage Water Management DIA includes reviewing, and when needed, revising alternatives to address the identified concern(s). The Drainage Water Management DIA documents: a) the client???s final decisions related to the associated drainage practice scenarios; and b) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern(s): Water Quality - Excess nutrients in surface and groundwaters, Plant Condition - Plant Productivity and Health, and Soil Health - Subsidence.

Before Situation:

Producer wants to improve drainage water management on their agricultural operation to address water quality, plant condition, or soil health concerns. Producer intends to work with a certified TSP to develop designs to implement one or more practice scenarios to address identified resource concerns using the Drainage Water Management DIA. The DIA 164 criteria incorporates recommended measures to increase water quality, plant condition, or soil health. Associated Practices: 554-Drainage Water Management, 604-Saturated Buffer, 605-Denitrifying Bioreactor, 606-Subsurface Drain, 607-Surface Drain, Field Ditch, 608-Surface Drain, Main or Lateral, 587-Structure for Water Control, 590-Nutrient Management, 340-Cover Crop, or other applicable practices in the NRCS Field Office Technical Guide.

After Situation:

The producer has obtained services from a certified TSP to develop practice scenario designs using the Drainage Water Management DIA. The DIA 164 criteria include tasks needed to document the client???s decisions and design of conservation practices which address water quality, plant condition, or soil health. The Drainage Water Management DIA meets the quality criteria for the DIA 164 activity as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $9,315.76

Scenario Cost/Unit: $9,315.76

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, small surveying crew	1296	Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. Cost associated with this component includes two man field crew, equipment, vehicle, overhead, and miscellaneous supplies.	Hours	$122.89	16	$1,966.24
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	40	$4,268.80
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$85.82	16	$1,373.12
Cap Labor, Survey and Mapping Technician	1591	Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. May verify accuracy and completeness of maps.	Hours	$62.48	16	$999.68

CAP Labor, Skilled	1604	Conservation Activity Plan labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$39.97	16	$639.52
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$34.20	2	$68.40

Practice: 164 - Improved Management of Drainage Water Design

Scenario: #53 - 3 or More Designs - No Tile Map Available

Scenario Description:

An agricultural producer wishes to address water quality degradation, poor plant productivity and health, and/or oxidation of organic matter in soils on a relatively flat crop field with a patterned drainage system through an EQIP contract with multiple drainage practice scenario. A map of the tile system is not available. Each 'Design' indicates that new devices or components are closely related to other devices or components of the drainage water management system even if numerous designs are contracted. If more than one practice is contracted, then '2-5 Designs' shall be contracted for the Drainage Water Management DIA. The Drainage Water Management DIA includes reviewing, and, when needed, revising alternatives to address the identified concern(s). The Drainage Water Management DIA documents: a) the client???s final decisions related to the associated drainage practice scenarios; and b) design deliverables described in the associated NRCS Conservation Practice Statements of Work. Natural Resource Concern(s): Water Quality - Excess nutrients in surface and groundwaters, Plant Condition - Plant Productivity and Health, and Soil Health - Subsidence.

Before Situation:

Producer wants to improve drainage water management on their agricultural operation to address water quality, plant condition, or soil health concerns. Producer intends to work with a certified TSP to develop designs to implement one or more practice scenarios to address identified resource concerns using the Drainage Water Management DIA. The DIA 164 criteria incorporates recommended measures to increase water quality, plant condition, or soil health. Associated Practices: 554-Drainage Water Management, 604-Saturated Buffer, 605-Denitrifying Bioreactor, 606-Subsurface Drain, 607-Surface Drain, Field Ditch, 608-Surface Drain, Main or Lateral, 587-Structure for Water Control, 590-Nutrient Management, 340-Cover Crop, or other applicable practices in the NRCS Field Office Technical Guide.

After Situation:

The producer has obtained services from a certified TSP to develop practice scenario designs using the Drainage Water Management DIA. The DIA 164 criteria include tasks needed to document the client???s decisions and design of conservation practices which address water quality, plant condition, or soil health. The Drainage Water Management DIA meets the quality criteria for the DIA 164 activity as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $11,709.88

Scenario Cost/Unit: $11,709.88

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, small surveying crew	1296	Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. Cost associated with this component includes two man field crew, equipment, vehicle, overhead, and miscellaneous supplies.	Hours	$122.89	16	$1,966.24
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	48	$5,122.56
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$85.82	24	$2,059.68
Cap Labor, Survey and Mapping Technician	1591	Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. May verify accuracy and completeness of maps.	Hours	$62.48	24	$1,499.52

CAP Labor, Skilled	1604	Conservation Activity Plan labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$39.97	24	$959.28
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$34.20	3	$102.60

Practice: 165 - Forest Management Practice Design

Scenario: #5 - DIA Less Than or Equal to 20 acres

Scenario Description:

Nonindustrial Private Forest Land with a forest management plan. Typical site is approximately 1 to 20 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

Before Situation:

The producer currently manages forested lands with an existing forest management plan. Resource concerns exist which are not addressed by a management plan. A Design and Implementation Activities is needed to allow the producer to apply for financial assistance through EQIP or other programs to develop implementation requirements for conservation practices. Associated Practices: 472, 666, 654, 655,384, 394, 383, 379, 338, 381, 391, 791, 490, 612, 660, 311, 380, 314, 315.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Forest Management Design and Implementation Activities (DIA). The DIA criteria requires the design of site-specific forestry activities as a component of a forest management plan to address identified resource concerns. Additional DIA criteria are detailed in the Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $422.95

Scenario Cost/Unit: $422.95

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, forester	1302	Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage.	Hours	$84.59	5	$422.95

Practice: 165 - Forest Management Practice Design

Scenario: #21 - DIA 501 to 1000 acres

Scenario Description:

Nonindustrial Private Forest Land with a forest management plan. Typical site is approximately 501 to 1000 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

Before Situation:

The producer currently manages forested lands with an existing forest management plan. Resource concerns exist which are not addressed by a management plan. A Design and Implementation Activities is needed to allow the producer to apply for financial assistance through EQIP or other programs to develop implementation requirements for conservation practices. Associated Practices: 472, 666, 654, 655,384, 394, 383, 379, 338, 381, 391, 791, 490, 612, 660, 311, 380, 314, 315.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Forest Management Design and Implementation Activities (DIA). The DIA criteria requires the design of site-specific forestry activities as a component of a forest management plan to address identified resource concerns. Additional DIA criteria are detailed in the Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $1,607.21

Scenario Cost/Unit: $1,607.21

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, forester	1302	Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage.	Hours	$84.59	19	$1,607.21

Practice: 165 - Forest Management Practice Design

Scenario: #37 - DIA 101 to 250 acres

Scenario Description:

Nonindustrial Private Forest Land with a forest management plan. Typical site is approximately 101 to 250 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

Before Situation:

The producer currently manages forested lands with an existing forest management plan. Resource concerns exist which are not addressed by a management plan. A Design and Implementation Activities is needed to allow the producer to apply for financial assistance through EQIP or other programs to develop implementation requirements for conservation practices. Associated Practices: 472, 666, 654, 655,384, 394, 383, 379, 338, 381, 391, 791, 490, 612, 660, 311, 380, 314, 315.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Forest Management Design and Implementation Activities (DIA). The DIA criteria requires the design of site-specific forestry activities as a component of a forest management plan to address identified resource concerns. Additional DIA criteria are detailed in the Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $1,015.08

Scenario Cost/Unit: $1,015.08

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, forester	1302	Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage.	Hours	$84.59	12	$1,015.08

Practice: 165 - Forest Management Practice Design

Scenario: #53 - DIA Greater Than 1000 acres

Scenario Description:

Nonindustrial Private Forest Land with a forest management plan. Typical site is approximately 1001 acres or greater in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

Before Situation:

The producer currently manages forested lands with an existing forest management plan. Resource concerns exist which are not addressed by a management plan. A Design and Implementation Activities is needed to allow the producer to apply for financial assistance through EQIP or other programs to develop implementation requirements for conservation practices. Associated Practices: 472, 666, 654, 655,384, 394, 383, 379, 338, 381, 391, 791, 490, 612, 660, 311, 380, 314, 315.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Forest Management Design and Implementation Activities (DIA). The DIA criteria requires the design of site-specific forestry activities as a component of a forest management plan to address identified resource concerns. Additional DIA criteria are detailed in the Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $1,945.57

Scenario Cost/Unit: $1,945.57

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, forester	1302	Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage.	Hours	$84.59	23	$1,945.57

Practice: 165 - Forest Management Practice Design

Scenario: #69 - DIA 251 to 500 acres

Scenario Description:

Nonindustrial Private Forest Land with a forest management plan. Typical site is approximately 251 to 500 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

Before Situation:

The producer currently manages forested lands with an existing forest management plan. Resource concerns exist which are not addressed by a management plan. A Design and Implementation Activities is needed to allow the producer to apply for financial assistance through EQIP or other programs to develop implementation requirements for conservation practices. Associated Practices: 472, 666, 654, 655,384, 394, 383, 379, 338, 381, 391, 791, 490, 612, 660, 311, 380, 314, 315.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Forest Management Design and Implementation Activities (DIA). The DIA criteria requires the design of site-specific forestry activities as a component of a forest management plan to address identified resource concerns. Additional DIA criteria are detailed in the Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $1,353.44

Scenario Cost/Unit: $1,353.44

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, forester	1302	Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage.	Hours	$84.59	16	$1,353.44

Practice: 165 - Forest Management Practice Design

Scenario: #85 - DIA 21 to 100 acres

Scenario Description:

Nonindustrial Private Forest Land with a forest management plan. Typical site is approximately 21 to 100 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

Before Situation:

The producer currently manages forested lands with an existing forest management plan. Resource concerns exist which are not addressed by a management plan. A Design and Implementation Activities is needed to allow the producer to apply for financial assistance through EQIP or other programs to develop implementation requirements for conservation practices. Associated Practices: 472, 666, 654, 655,384, 394, 383, 379, 338, 381, 391, 791, 490, 612, 660, 311, 380, 314, 315.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the Forest Management Design and Implementation Activities (DIA). The DIA criteria requires the design of site-specific forestry activities as a component of a forest management plan to address identified resource concerns. Additional DIA criteria are detailed in the Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $676.72

Scenario Cost/Unit: $676.72

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, forester	1302	Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage.	Hours	$84.59	8	$676.72

Practice: 199 - Conservation Plan

Scenario: #21 - Small Farm - less than or equal to 10 acres

Scenario Description:

Conservation plan developed by a Technical Service Provider (TSP) for a participant enrolled in a Farm Bill program contract. The TSP completes NRCS conservation planning process, steps 1 through 7 as described in NRCS National Planning Procedures Handbook. The steps identify problems and opportunities (step 1), determine objectives (step 2), include inventory and analyze resources (steps 3 and 4), formulate and evaluate alternatives (steps 5 and 6) and document client???s preferred alternative(s) (step 7). The small farm planning scenario involves combinations of various specialty crops, small fruits, tree and vine crops, and small livestock enterprises on less than or equal to 10 acres.

Before Situation:

Client and NRCS have identified a need to develop a conservation plan to address resource concern(s) using a Technical Service Provider.

After Situation:

TSP has met with client and visited the planning area, in order to develop at least one conservation system alternative for each planning land unit that meet the producer's objectives; and obtain the client's decision for a schedule of practices to implement. TSP provides deliverables that meet the requirements of the CPA 199, or (if applicable to the enterprise) the requirements of conservation activities CPA 102 CNMP or CPA 106 Forestry Plan.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $3,311.98

Scenario Cost/Unit: $3,311.98

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$108.51	10	$1,085.10
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	8	$853.76
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$85.82	16	$1,373.12

Practice: 199 - Conservation Plan

Scenario: #37 - Low Complexity Plan, <200 acres

Scenario Description:

Conservation plan developed by a Technical Service Provider (TSP) for a participant enrolled in a Farm Bill program contract. The TSP completes NRCS conservation planning process, steps 1 through 7 as described in NRCS National Planning Procedures Handbook. The steps identify problems and opportunities (step 1), determine objectives (step 2), include inventory and analyze resources (steps 3 and 4), formulate and evaluate alternatives (steps 5 and 6) and document client???s preferred alternative(s) (step 7). The Planning Land Unit involves one land use and one agricultural enterprise covering up to less than 200 acres.

Before Situation:

Client and NRCS have identified a need to develop a conservation plan to address resource concern(s) using a Technical Service Provider.

After Situation:

TSP has met with client and visited the planning area, in order to develop at least one conservation system alternative for each planning land unit that meet the producer's objectives; and obtain the client's decision for a schedule of practices to implement. TSP provides deliverables that meet the requirements of the CPA 199, or (if applicable to the enterprise) the requirements of conservation activities CPA 102 CNMP or CPA 106 Forestry Plan.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $4,208.40

Scenario Cost/Unit: $4,208.40

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$108.51	8	$868.08
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	12	$1,280.64
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$85.82	24	$2,059.68

Practice: 199 - Conservation Plan

Scenario: #53 - Low Complexity Plan, 200-1,000 acres

Scenario Description:

Conservation plan developed by a Technical Service Provider (TSP) for a participant enrolled in a Farm Bill program contract. The TSP completes NRCS conservation planning process, steps 1 through 7 as described in NRCS National Planning Procedures Handbook. The steps identify problems and opportunities (step 1), determine objectives (step 2), include inventory and analyze resources (steps 3 and 4), formulate and evaluate alternatives (steps 5 and 6) and document client???s preferred alternative(s) (step 7). The Planning Land Unit involves one land use and one agricultural enterprise covering 200-1,000 acres.

Before Situation:

Client and NRCS have identified a need to develop a conservation plan to address resource concern(s) using a Technical Service Provider.

After Situation:

TSP has met with client and visited the planning area, in order to develop at least one conservation system alternative for each planning land unit that meet the producer's objectives; and obtain the client's decision for a schedule of practices to implement. TSP provides deliverables that meet the requirements of the CPA 199, or (if applicable to the enterprise) the requirements of conservation activities CPA 102 CNMP or CPA 106 Forestry Plan.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $6,189.92

Scenario Cost/Unit: $6,189.92

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$108.51	16	$1,736.16
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	16	$1,707.52
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$85.82	32	$2,746.24

Practice: 199 - Conservation Plan

Scenario: #69 - Low Complexity Plan, >1,000 acres

Scenario Description:

Conservation plan developed by a Technical Service Provider (TSP) for a participant enrolled in a Farm Bill program contract. The TSP completes NRCS conservation planning process, steps 1 through 7 as described in NRCS National Planning Procedures Handbook. The steps identify problems and opportunities (step 1), determine objectives (step 2), include inventory and analyze resources (steps 3 and 4), formulate and evaluate alternatives (steps 5 and 6) and document client???s preferred alternative(s) (step 7). The Planning Land Unit involves one land use and one agricultural enterprise covering more than 1,000 acres.

Before Situation:

Client and NRCS have identified a need to develop a conservation plan to address resource concern(s) using a Technical Service Provider.

After Situation:

TSP has met with client and visited the planning area, in order to develop at least one conservation system alternative for each planning land unit that meet the producer's objectives; and obtain the client's decision for a schedule of practices to implement. TSP provides deliverables that meet the requirements of the CPA 199, or (if applicable to the enterprise) the requirements of conservation activities CPA 102 CNMP or CPA 106 Forestry Plan.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $8,249.60

Scenario Cost/Unit: $8,249.60

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$108.51	16	$1,736.16
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	16	$1,707.52
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$85.82	56	$4,805.92

Practice: 199 - Conservation Plan

Scenario: #85 - Medium Complexity Plan, <200 acres

Scenario Description:

Conservation plan developed by a Technical Service Provider (TSP) for a participant enrolled in a Farm Bill program contract. The TSP completes NRCS conservation planning process, steps 1 through 7 as described in NRCS National Planning Procedures Handbook. The steps identify problems and opportunities (step 1), determine objectives (step 2), include inventory and analyze resources (steps 3 and 4), formulate and evaluate alternatives (steps 5 and 6) and document client???s preferred alternative(s) (step 7). The Planning Land Unit involves one land use with two agricultural enterprises, or two land uses with one agricultural enterprise (ex. farmstead and cropland used for a dairy enterprise) covering less than 200 acres.

Before Situation:

Client and NRCS have identified a need to develop a conservation plan to address resource concern(s) using a Technical Service Provider.

After Situation:

TSP has met with client and visited the planning area, in order to develop at least one conservation system alternative for each planning land unit that meet the producer's objectives; and obtain the client's decision for a schedule of practices to implement. TSP provides deliverables that meet the requirements of the CPA 199, and/or (if applicable to the enterprises) the requirements of conservation activities CPA 102 CNMP or CPA 106 Forestry Plan.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $6,189.92

Scenario Cost/Unit: $6,189.92

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$108.51	16	$1,736.16
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	16	$1,707.52
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$85.82	32	$2,746.24

Practice: 199 - Conservation Plan

Scenario: #101 - Medium Complexity Plan, 200-1,000 acres

Scenario Description:

Conservation plan developed by a Technical Service Provider (TSP) for a participant enrolled in a Farm Bill program contract. The TSP completes NRCS conservation planning process, steps 1 through 7 as described in NRCS National Planning Procedures Handbook. The steps identify problems and opportunities (step 1), determine objectives (step 2), include inventory and analyze resources (steps 3 and 4), formulate and evaluate alternatives (steps 5 and 6) and document client???s preferred alternative(s) (step 7). The Planning Land Unit involves one land use with two agricultural enterprises, or two land uses with one agricultural enterprise (ex. farmstead and cropland used for a dairy enterprise) covering 200-1000 acres.

Before Situation:

Client and NRCS have identified a need to develop a conservation plan to address resource concern(s) using a Technical Service Provider.

After Situation:

TSP has met with client and visited the planning area, in order to develop at least one conservation system alternative for each planning land unit that meet the producer's objectives; and obtain the client's decision for a schedule of practices to implement. TSP provides deliverables that meet the requirements of the CPA 199, and/or (if applicable to the enterprises) the requirements of conservation activities CPA 102 CNMP or CPA 106 Forestry Plan.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $8,249.60

Scenario Cost/Unit: $8,249.60

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$108.51	16	$1,736.16
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	16	$1,707.52
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$85.82	56	$4,805.92

Practice: 199 - Conservation Plan

Scenario: #117 - Medium Complexity Plan, >1,000 acres

Scenario Description:

Conservation plan developed by a Technical Service Provider (TSP) for a participant enrolled in a Farm Bill program contract. The TSP completes NRCS conservation planning process, steps 1 through 7 as described in NRCS National Planning Procedures Handbook. The steps identify problems and opportunities (step 1), determine objectives (step 2), include inventory and analyze resources (steps 3 and 4), formulate and evaluate alternatives (steps 5 and 6) and document client???s preferred alternative(s) (step 7). The Planning Land Unit involves one land use with two agricultural enterprises, or two land uses with one agricultural enterprise (ex. farmstead and cropland used for a dairy enterprise) covering more than 1,000 acres.

Before Situation:

Client and NRCS have identified a need to develop a conservation plan to address resource concern(s) using a Technical Service Provider.

After Situation:

TSP has met with client and visited the planning area, in order to develop at least one conservation system alternative for each planning land unit that meet the producer's objectives; and obtain the client's decision for a schedule of practices to implement. TSP provides deliverables that meet the requirements of the CPA 199, and/or (if applicable to the enterprises) the requirements of conservation activities CPA 102 CNMP or CPA 106 Forestry Plan.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $10,053.18

Scenario Cost/Unit: $10,053.18

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$108.51	18	$1,953.18
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	18	$1,920.96
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$85.82	72	$6,179.04

Practice: 199 - Conservation Plan

Scenario: #133 - High Complexity Plan, <200 acres

Scenario Description:

Conservation plan developed by a Technical Service Provider (TSP) for a participant enrolled in a Farm Bill program contract. The TSP completes NRCS conservation planning process, steps 1 through 7 as described in NRCS National Planning Procedures Handbook. The steps identify problems and opportunities (step 1), determine objectives (step 2), include inventory and analyze resources (steps 3 and 4), formulate and evaluate alternatives (steps 5 and 6) and document client???s preferred alternative(s) (step 7). The Planning Land Unit involves one land use supporting three or more agricultural enterprises, two land uses supporting two or more agricultural enterprises, or three or more land uses and any number of enterprises on up to less than 200 acres.

Before Situation:

Client and NRCS have identified a need to develop a conservation plan to address resource concern(s) using a Technical Service Provider.

After Situation:

TSP has met with client and visited the planning area, in order to develop at least one conservation system alternative for each planning land unit that meet the producer's objectives; and obtain the client's decision for a schedule of practices to implement. TSP provides deliverables that meet the requirements of the CPA 199, and/or (if applicable to the enterprises) the requirements of conservation activities CPA 102 CNMP or CPA 106 Forestry Plan.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $8,249.60

Scenario Cost/Unit: $8,249.60

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$108.51	16	$1,736.16
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	16	$1,707.52
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$85.82	56	$4,805.92

Practice: 199 - Conservation Plan

Scenario: #149 - High Complexity Plan, 200-1,000 acres

Scenario Description:

Conservation plan developed by a Technical Service Provider (TSP) for a participant enrolled in a Farm Bill program contract. The TSP completes NRCS conservation planning process, steps 1 through 7 as described in NRCS National Planning Procedures Handbook. The steps identify problems and opportunities (step 1), determine objectives (step 2), include inventory and analyze resources (steps 3 and 4), formulate and evaluate alternatives (steps 5 and 6) and document client???s preferred alternative(s) (step 7). The Planning Land Unit involves three or more agricultural enterprises, two land uses supporting two or more agricultural enterprises, or three or more land uses and any number of enterprises on 200-1000 acres.

Before Situation:

Client and NRCS have identified a need to develop a conservation plan to address resource concern(s) using a Technical Service Provider.

After Situation:

TSP has met with client and visited the planning area, in order to develop at least one conservation system alternative for each planning land unit that meet the producer's objectives; and obtain the client's decision for a schedule of practices to implement. TSP provides deliverables that meet the requirements of the CPA 199, and/or (if applicable to the enterprises) the requirements of conservation activities CPA 102 CNMP or CPA 106 Forestry Plan.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $10,053.18

Scenario Cost/Unit: $10,053.18

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$108.51	18	$1,953.18
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	18	$1,920.96
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$85.82	72	$6,179.04

Practice: 199 - Conservation Plan

Scenario: #165 - High Complexity Plan, >1,000 acres

Scenario Description:

Conservation plan developed by a Technical Service Provider (TSP) for a participant enrolled in a Farm Bill program contract. The TSP completes NRCS conservation planning process, steps 1 through 7 as described in NRCS National Planning Procedures Handbook. The steps identify problems and opportunities (step 1), determine objectives (step 2), include inventory and analyze resources (steps 3 and 4), formulate and evaluate alternatives (steps 5 and 6) and document client???s preferred alternative(s) (step 7). The Planning Land Unit involves one land use supporting three or more agricultural enterprises, two land uses supporting two or more agricultural enterprises, or three or more land uses and any number of enterprises on more than 1,000 acres.

Before Situation:

Client and NRCS have identified a need to develop a conservation plan to address resource concern(s) using a Technical Service Provider.

After Situation:

TSP has met with client and visited the planning area, in order to develop at least one conservation system alternative for each planning land unit that meet the producer's objectives; and obtain the client's decision for a schedule of practices to implement. TSP provides deliverables that meet the requirements of the CPA 199, and/or (if applicable to the enterprises) the requirements of conservation activities CPA 102 CNMP or CPA 106 Forestry Plan.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $11,600.66

Scenario Cost/Unit: $11,600.66

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$108.51	22	$2,387.22
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	22	$2,347.84
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$85.82	80	$6,865.60

Practice: 201 - Edge-of-Field Water Quality Monitoring-Data Collection and Evaluation

Scenario: #104 - Data Collect Surface Year 1-QAPP

Scenario Description:

This practice scenario provides for the design and use of an edge-of-field WQ monitoring station(s) for surface run-off for one control and one treatment site with an average of 20 samples per year per station, with each sample analyzed for 6 separate parameters (2 sites x 20 samples x 6 parameters = 240 total water quality tests). The scenario requires the creation of a survey to site a monitoring station, preparation of monitoring plan and a quality assurance project plan to detail how data will be collected, handled and analyzed, provides for the data collection, analysis, semiannual report, and annual report. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP need to be prepared prior to installation under Edge-of-Field Water Quality Monitoring - System Installation (202). THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation:

The agricultural operation prior to installing this practice will not have a plan or quality assurance project plan prepared for installing equipment nor collecting data for sediment and nutrients leaving the edge of field.

After Situation:

This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual report, and annual report for one control and one treatment site. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP have been prepared prior to installation under Edge-of-Field Water Quality Monitoring - System Installation (202). The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201.

Feature Measure: Measuring Sites

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $32,755.30

Scenario Cost/Unit: $32,755.30

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	130	$5,703.10
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	136	$15,157.20
Materials						
Testing, Blanks Samples	2612	Blanks or Duplicate Samples; Includes materials only.	Each	$48.75	4	$195.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration ??? Preferred, or Total Suspended Solids. Includes materials only.	Each	$48.75	240	$11,700.00

Practice: 201 - Edge-of-Field Water Quality Monitoring-Data Collection and Evaluation

Scenario: #105 - Data Collect Surface Year 1 - NO QAPP

Scenario Description:

This practice scenario provides for the use of an edge-of-field WQ monitoring station(s) for surface run-off for one control and one treatment site. The scenario requires the collection and analysis of edge-of-field water quality data with an average sample collection of 20 per year for surface sytems. The data will be transferred through semi-annual submittal and annual report which include some preliminary annual analysis. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP will be not prepared as this is for an existing monitoring system that has been accepted as meeting both Activity 201 and 202. THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation:

The agricultural operation prior to installing this practice will have an existing system for collecting water quality data but not have been operating with a long enough time frame to measure practice effectiveness.

After Situation:

This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual submittal, and annual report for one control and one treatment site. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP have been prepared as part of an existing monitoring system installation where the QAPP and monitoring plan meets Activity 201 requirements and no major changes are needed to meet Activity 202 requirements. The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201.

Feature Measure: Measuring Site

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $23,601.70

Scenario Cost/Unit: $23,601.70

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$108.51	60	$6,510.60
CAP Labor, Skilled	1604	Conservation Activity Plan labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$39.97	130	$5,196.10
Materials						
Testing, Blanks Samples	2612	Blanks or Duplicate Samples; Includes materials only.	Each	$48.75	4	$195.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration ??? Preferred, or Total Suspended Solids. Includes materials only.	Each	$48.75	20	$975.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration ??? Preferred, or Total Suspended Solids. Includes materials only.	Each	$48.75	40	$1,950.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration ??? Preferred, or Total Suspended Solids. Includes materials only.	Each	$48.75	20	$975.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration ??? Preferred, or Total Suspended Solids. Includes materials only.	Each	$48.75	40	$1,950.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration ??? Preferred, or Total Suspended Solids. Includes materials only.	Each	$48.75	40	$1,950.00

Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration ??? Preferred, or Total Suspended Solids. Includes materials only.	Each	$48.75	40	$1,950.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration ??? Preferred, or Total Suspended Solids. Includes materials only.	Each	$48.75	40	$1,950.00

Practice: 201 - Edge-of-Field Water Quality Monitoring-Data Collection and Evaluation

Scenario: #106 - Data Collect Surface Year 1 plus - NO QAPP

Scenario Description:

This practice scenario provides for the use of an edge-of-field WQ monitoring station(s) for surface run-off for one control and one treatment site. The scenario requires the collection and analysis of edge-of-field water quality data with an average sample collection of 20 per year per station, with each sample analyzed for 6 separate parameters (2 sites x 20 samples x 6 parameters = 240 total water quality tests). The data will be transferred through semi-annual submittal and annual report which include some preliminary annual analysis. This scenario will normally be used in year 1 to next to the last year of monitoring of the contract when a monitoring plan and QAPP will be not prepared as this is for an existing monitoring system that has been accepted as meeting both Activity 201 and 202. THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation:

The agricultural operation prior to installing this practice will have an existing system for collecting water quality data but not have been operating with a long enough time frame to measure practice effectiveness.

After Situation:

This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual submittal, and annual report for one control and one treatment site. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP have been prepared as part of an existing monitoring system installation where the QAPP and monitoring plan meets Activity 201 requirements and no major changes are needed to meet Activity 202 requirements. The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201.

Feature Measure: Measuring Site

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $24,285.10

Scenario Cost/Unit: $24,285.10

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	130	$5,703.10
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	60	$6,687.00
Materials						
Testing, Blanks Samples	2612	Blanks or Duplicate Samples; Includes materials only.	Each	$48.75	4	$195.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration ??? Preferred, or Total Suspended Solids. Includes materials only.	Each	$48.75	240	$11,700.00

Practice: 201 - Edge-of-Field Water Quality Monitoring-Data Collection and Evaluation

Scenario: #107 - Data Collect Surface Last Year

Scenario Description:

This practice scenario provides for the use of an edge-of-field WQ monitoring station(s) for surface run-off for one control and one treatment site with an average of 20 samples per year per station, with each sample analyzed for 6 separate parameters (2 sites x 20 samples x 6 parameters = 240 total water quality tests). The scenario requires the collection and analysis of edge-of-field water quality data along with a comprehensive report to statistically prove relationship between select conservation practices and water quality. The data will be transferred through semi-annual submittal and annual report and a comprehensive report of practice effectiveness. This scenario will be used in the last year of monitoring. THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation:

The agricultural operation prior to installing this practice will have an existing system for collecting water quality data but not have been operating with a long enough time frame to measure practice effectiveness.

After Situation:

This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual submittal, and annual report for one control and one treatment site. The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201 to provide a comprehensive report of statistical testing of data collected to complete monitoring period.

Feature Measure: Measuring Site

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $28,743.10

Scenario Cost/Unit: $28,743.10

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	130	$5,703.10
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	100	$11,145.00
Materials						
Testing, Blanks Samples	2612	Blanks or Duplicate Samples; Includes materials only.	Each	$48.75	4	$195.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration ??? Preferred, or Total Suspended Solids. Includes materials only.	Each	$48.75	240	$11,700.00

Practice: 201 - Edge-of-Field Water Quality Monitoring-Data Collection and Evaluation

Scenario: #108 - Data Collect Tile Year 1-QAPP

Scenario Description:

This practice scenario provides for the design and use of an edge-of-field WQ monitoring station(s) for tile and subsurface drainage run-off for one control and one treatment site with an average of 40 samples per year per station, with each sample analyzed for 6 separate parameters (2 sites x 40 samples x 6 parameters = 480 total water quality tests). A subsurface system also requires the addition of a surface sampling system at the same outlet to capture overland flow with 20 samples per year, with each sample analyzed for 6 separate parameters (2 sites x 20 samples x 6 parameters = 240 total water quality tests). Without the surface system then not all runoff is captured for calculating a true event mean concentration as per the 201 Standard. The scenario requires the creation of a survey to site a monitoring station, preparation of monitoring plan and a quality assurance project plan to detail how data will be collected, handled and analyzed, provides for the data collection, analysis, semiannual report, and annual report. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP need to be prepared prior to installation under Edge-of-Field Water Quality Monitoring - System Installation (202). THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation:

The agricultural operation prior to installing this practice will not have a plan or quality assurance project plan prepared for installing equipment nor collecting data for sediment and nutrients leaving the edge of field.

After Situation:

This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual report, and annual report for one control and one treatment site. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP have been prepared prior to installation under Edge-of-Field Water Quality Monitoring - System Installation (202). The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201.

Feature Measure: Measuring Site

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $67,873.14

Scenario Cost/Unit: $67,873.14

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	312	$13,687.44
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	166	$18,500.70
Materials						
Testing, Blanks Samples	2612	Blanks or Duplicate Samples; Includes materials only.	Each	$48.75	12	$585.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration ??? Preferred, or Total Suspended Solids. Includes materials only.	Each	$48.75	720	$35,100.00

Practice: 201 - Edge-of-Field Water Quality Monitoring-Data Collection and Evaluation

Scenario: #109 - Data Collect Tile Year 1 plus - NO QAPP

Scenario Description:

This practice scenario provides for the design and use of an edge-of-field WQ monitoring station(s) for tile and subsurface drainage run-off for one control and one treatment site with an average of 40 samples per year per station, with each sample analyzed for 6 separate parameters (2 sites x 40 samples x 6 parameters = 480 total water quality tests). A subsurface system also requires the addition of a surface sampling system at the same outlet to capture overland flow with 20 samples per year, with each sample analyzed for 6 separate parameters (2 sites x 20 samples x 6 parameters = 240 total water quality tests). Without the surface system then not all runoff is captured for calculating a true event mean concentration as per the 201 Standard. The data will be transferred through semi-annual submittal and annual reports, which include some preliminary annual analysis. This scenario will normally be used in year 1 to next to the last year of monitoring of the contract when a monitoring plan and QAPP will be not prepared as this is for an existing monitoring system be accepted as meeting both Activity 201 and 202. THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation:

The agricultural operation prior to installing this practice will have an existing system for collecting water quality data but not have been operating with a long enough time frame to measure practice effectiveness.

After Situation:

This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual submittal, and annual report for one control and one treatment site. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP have been prepared as part of an existing monitoring system installation where the QAPP and monitoring plan meets Activity 201 requirements and no major changes are needed to meet Activity 202 requirements. The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201.

Feature Measure: Measuring Site

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $59,402.94

Scenario Cost/Unit: $59,402.94

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	312	$13,687.44
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	90	$10,030.50
Materials						
Testing, Blanks Samples	2612	Blanks or Duplicate Samples; Includes materials only.	Each	$48.75	12	$585.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration ??? Preferred, or Total Suspended Solids. Includes materials only.	Each	$48.75	720	$35,100.00

Practice: 201 - Edge-of-Field Water Quality Monitoring-Data Collection and Evaluation

Scenario: #111 - Data Collect Tile Last Year

Scenario Description:

This practice scenario provides for the design and use of an edge-of-field WQ monitoring station(s) for tile and subsurface drainage run-off for one control and one treatment site with an average of 40 samples per year per station, with each sample analyzed for 6 separate parameters (2 sites x 40 samples x 6 parameters = 480 total water quality tests). A subsurface system also requires the addition of a surface sampling system at the same outlet to capture overland flow with 20 samples per year, with each sample analyzed for 6 separate parameters (2 sites x 20 samples x 6 parameters = 240 total water quality tests). Without the surface system then not all runoff is captured for calculating a true event mean concentration as per the 201 Standard. The scenario requires the collection and analysis of edge-of-field water quality data along with a comprehensive report to statistically prove relationship between select conservation practices and water quality. The data will be transferred through semi-annual submittal and annual report and a comprehensive report of practice effectiveness. This scenario will be used in the last year of monitoring. THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation:

The agricultural operation prior to installing this practice will have an existing system for collecting water quality data but not have been operating with a long enough time frame to measure practice effectiveness.

After Situation:

This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual submittal, and annual report for one control and one treatment site. The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201 to provide a comprehensive report of statistical testing of data collected during to complete monitoring period.

Feature Measure: Measuring site

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $63,860.94

Scenario Cost/Unit: $63,860.94

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	312	$13,687.44
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	130	$14,488.50
Materials						
Testing, Blanks Samples	2612	Blanks or Duplicate Samples; Includes materials only.	Each	$48.75	12	$585.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration ??? Preferred, or Total Suspended Solids. Includes materials only.	Each	$48.75	720	$35,100.00

Practice: 201 - Edge-of-Field Water Quality Monitoring-Data Collection and Evaluation

Scenario: #112 - Data Collect Surface Year 1-QAPP with two treatment Sites

Scenario Description:

This practice scenario provides for the design and use of an edge-of-field WQ monitoring station(s) for surface run-off for one control and two treatment sites with an average of 20 samples per year per station, with each sample analyzed for 6 separate parameters (3 sites x 20 samples x 6 parameters = 360 total water quality tests). The scenario requires the creation of a survey to site a monitoring station, preparation of monitoring plan and a quality assurance project plan to detail how data will be collected, handled and analyzed, provides for the data collection, analysis, semiannual report, and annual report. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP need to be prepared prior to installation under Edge-of-Field Water Quality Monitoring - System Installation (202). THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation:

The agricultural operation prior to installing this practice will not have a plan or quality assurance project plan prepared for installing equipment nor collecting data for sediment and nutrients leaving the edge of field.

After Situation:

This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual report, and annual report for one control and one treatment site. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP have been prepared prior to installation under Edge-of-Field Water Quality Monitoring - System Installation (202). The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201.

Feature Measure: Measuring Sites

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $45,193.02

Scenario Cost/Unit: $45,193.02

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	156	$6,843.72
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	184	$20,506.80
Materials						
Testing, Blanks Samples	2612	Blanks or Duplicate Samples; Includes materials only.	Each	$48.75	6	$292.50
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration ??? Preferred, or Total Suspended Solids. Includes materials only.	Each	$48.75	360	$17,550.00

Practice: 201 - Edge-of-Field Water Quality Monitoring-Data Collection and Evaluation

Scenario: #113 - Data Collect Surface Year 1+ less QAPP (pre-install information) with two treatment sites

Scenario Description:

This practice scenario provides for the use of an edge-of-field WQ monitoring station(s) for surface run-off for one control and two treatment sites. The scenario requires the collection and analysis of edge-of-field water quality data with an average sample collection of 20 per year for each surface system, with each sample analyzed for 6 separate parameters (3 sites x 20 samples x 6 parameters = 360 total water quality tests). The data will be transferred through semi-annual submittal and annual report, which include some preliminary annual analysis. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP will not be prepared as this is for an existing monitoring system be accepted as meeting both Activity 201 and 202. THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation:

The agricultural operation prior to installing this practice will have an existing system for collecting water quality data but not have been operating with a long enough time frame to measure practice effectiveness.

After Situation:

This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semi-annual submittal, and annual report for one control and two treatment sites. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP have been prepared as part of an existing monitoring system installation where the QAPP and monitoring plan meets Activity 201 requirements and no major changes are needed to meet Activity 202 requirements. The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201.

Feature Measure: Measuring site

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $34,716.72

Scenario Cost/Unit: $34,716.72

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	156	$6,843.72
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	90	$10,030.50
Materials						
Testing, Blanks Samples	2612	Blanks or Duplicate Samples; Includes materials only.	Each	$48.75	6	$292.50
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration ??? Preferred, or Total Suspended Solids. Includes materials only.	Each	$48.75	360	$17,550.00

Practice: 201 - Edge-of-Field Water Quality Monitoring-Data Collection and Evaluation

Scenario: #115 - Data Collect Surface Last Year with two treatment sites

Scenario Description:

This practice scenario provides for the use of an edge-of-field WQ monitoring station(s) for surface run-off for one control and two treatment sites with an average of 20 samples per year per station, with each sample analyzed for 6 separate parameters (3 sites x 20 samples x 6 parameters = 360 total water quality tests). The scenario requires the collection and analysis of edge-of-field water quality data along with a comprehensive report to statistically prove relationship between select conservation practices and water quality. The data will be transferred through semi-annual submittal and annual report and a comprehensive report of practice effectiveness. This scenario will be used in the last year of monitoring. THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation:

The agricultural operation prior to installing this practice will have an existing system for collecting water quality data but not have been operating with a long enough time frame to measure practice effectiveness.

After Situation:

This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual submittal, and annual report for one control and two treatment sites. The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201 to provide a comprehensive report of statistical testing of data collected during to complete monitoring period.

Feature Measure: Measuring site

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $41,403.72

Scenario Cost/Unit: $41,403.72

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	156	$6,843.72
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	150	$16,717.50
Materials						
Testing, Blanks Samples	2612	Blanks or Duplicate Samples; Includes materials only.	Each	$48.75	6	$292.50
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration ??? Preferred, or Total Suspended Solids. Includes materials only.	Each	$48.75	360	$17,550.00

Practice: 201 - Edge-of-Field Water Quality Monitoring-Data Collection and Evaluation

Scenario: #117 - Data Collect Tile Year 1+ less QAPP (pre-install information) with two treatment sites

Scenario Description:

This practice scenario provides for the design and use of an edge-of-field WQ monitoring station(s) for tile and subsurface drainage run-off for one control and two treatment sites with an average of 40 samples per year per station, with each sample analyzed for 6 separate parameters (3 sites x 40 samples x 6 parameters = 720 total water quality tests). A subsurface system also requires the addition of a surface sampling system at the same outlet to capture overland flow with 20 samples per year, with each sample analyzed for 6 separate parameters (3 sites x 20 samples x 6 parameters = 360 total water quality tests). Without the surface system then not all runoff is captured for calculating a true event mean concentration as per the 201 Standard. The data will be transferred through semi-annual submittal and annual reports, which include some preliminary annual analysis. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP will not be prepared as this is for an existing monitoring system be accepted as meeting both Activity 201 and 202. THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation:

The agricultural operation prior to installing this practice will have an existing system for collecting water quality data but not have been operating with a long enough time frame to measure practice effectiveness.

After Situation:

This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual submittal, and annual report for one control and two treatment sites. This scenario will normally be used in year 1 of the contract when a monitoring plan and QAPP have been prepared as part of an existing monitoring system installation where the QAPP and monitoring plan meets Activity 201 requirements and no major changes are needed to meet Activity 202 requirements. The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201.

Feature Measure: Measuring site

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $84,541.93

Scenario Cost/Unit: $84,541.93

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	364	$15,968.68
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	135	$15,045.75
Materials						
Testing, Blanks Samples	2612	Blanks or Duplicate Samples; Includes materials only.	Each	$48.75	18	$877.50
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration ??? Preferred, or Total Suspended Solids. Includes materials only.	Each	$48.75	1080	$52,650.00

Practice: 201 - Edge-of-Field Water Quality Monitoring-Data Collection and Evaluation

Scenario: #119 - Data Collect Tile Last Year with two treatment sites

Scenario Description:

This practice scenario provides for the design and use of an edge-of-field WQ monitoring station(s) for tile and subsurface drainage run-off for one control and two treatment sites with an average of 40 samples per year per station with each sample analyzed for 6 separate parameters (3 sites x 40 samples x 6 parameters = 720 total water quality tests). A subsurface system also requires the addition of a surface sampling system at the same outlet to capture overland flow with 20 samples per year with each sample analyzed for 6 separate parameters (3 sites x 20 samples x 6 parameters = 360 total water quality tests). Without the surface system then not all runoff is captured for calculating a true event mean concentration as per the 201 Standard. The scenario requires the collection and analysis of edge-of-field water quality data along with a comprehensive report to statistically prove relationship between select conservation practices and water quality. The data will be transferred through semi-annual submittal and annual report and a comprehensive report of practice effectiveness. This scenario will be used in the last year of monitoring. THIS IS PLACED IN A PAIRED SITUATION IF THE CONTROL AND TREATMENT ARE ON DIFFERENT LANDOWNERS FIELDS THEN A JOINT CONTRACT WILL BE NECESSARY.

Before Situation:

The agricultural operation prior to installing this practice will have an existing system for collecting water quality data but not have been operating with a long enough time frame to measure practice effectiveness.

After Situation:

This practice scenario after installation of the WQ monitoring stations, provides for the data collection, analysis, semiannual submittal, and annual report for one control and two treatment sites. The operator will be able to collect field level water quality data of sufficient quality to measure loss of nutrients as listed in 201 to provide a comprehensive report of statistical testing of data collected during to complete monitoring period.

Feature Measure: Measuring site

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $91,228.93

Scenario Cost/Unit: $91,228.93

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	364	$15,968.68
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	195	$21,732.75
Materials						
Testing, Blanks Samples	2612	Blanks or Duplicate Samples; Includes materials only.	Each	$48.75	18	$877.50
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration ??? Preferred, or Total Suspended Solids. Includes materials only.	Each	$48.75	1080	$52,650.00

Practice: 201 - Edge-of-Field Water Quality Monitoring-Data Collection and Evaluation

Scenario: #215 - Data Collect - Discrete Sampling, Year 1, Single Parameter

Scenario Description:

This scenario is to be used for targeted, periodic WQ grab sampling design and implementation for evaluating and assessing conservation practice performance. This scenario provides for collection and analysis of one of the following water quality constituents: Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration, or Total Suspended Solids. A monitoring plan is created by a qualified individual to achieve monitoring goals. Event-based or regularly re-occurring grab samples are acquired from the concentrated flow streams at 2 locations, typically in a before-and-after or a side-by-side sampling design and then analyzed at a laboratory.

Before Situation:

The agricultural operation prior to implementing this activity will not have a monitoring plan prepared for evaluating and assessing the performance of a conservation practice.

After Situation:

The agricultural operation after implementing this activity will have produced and implemented a water quality monitoring plan for a single water quality constituent to evaluate and assess the performance of a conservation practice with respect to that constituent.

Feature Measure: Measuring sites

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $7,671.84

Scenario Cost/Unit: $7,671.84

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	72	$3,158.64
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	16	$1,783.20
Materials						
Testing, Blanks Samples	2612	Blanks or Duplicate Samples; Includes materials only.	Each	$48.75	8	$390.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration ??? Preferred, or Total Suspended Solids. Includes materials only.	Each	$48.75	48	$2,340.00

Practice: 201 - Edge-of-Field Water Quality Monitoring-Data Collection and Evaluation

Scenario: #231 - Data Collect - Discrete Sampling, Single Parameter, Additional Year

Scenario Description:

This scenario extends, by an additional year, discreet WQ grab sampling design and implementation for evaluating and assessing conservation practice performance. This scenario provides for analysis of one of the following water quality constituents: Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration, or Total Suspended Solids. A monitoring plan is created by a qualified individual to achieve monitoring goals. Event-based or regularly re-occurring synoptic grab samples are acquired from the concentrated flow streams at 2 locations, typically in a before-and-after or a side-by-side sampling design and then analyzed at a laboratory.

Before Situation:

The agricultural operation prior to implementing this activity will not have a monitoring plan prepared for evaluating and assessing the performance of a conservation practice.

After Situation:

The agricultural operation after implementing this activity will have produced and implemented a water quality monitoring plan for a single water quality constituent to evaluate and assess the performance of a conservation practice with respect to that constituent.

Feature Measure: Measuring Sites

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $6,334.44

Scenario Cost/Unit: $6,334.44

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	72	$3,158.64
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	4	$445.80
Materials						
Testing, Blanks Samples	2612	Blanks or Duplicate Samples; Includes materials only.	Each	$48.75	8	$390.00
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration ??? Preferred, or Total Suspended Solids. Includes materials only.	Each	$48.75	48	$2,340.00

Practice: 202 - Edge-of-Field Water Quality Monitoring-System Installation

Scenario: #72 - System Installation-Surface

Scenario Description:

This edge-of-field water quality monitoring system is applicable to a single control or treatment site that has a field defined with surface runoff that can be captured and sampled at the edge of a field before entering a ditch or receiving water body or water course. The component monitoring equipment are associated with a typical system for southern latitudes where winter time heating is not required for sampling. It will allow for installation of automated sampling data collection system with protective housing to reduce potential for vandalism, battery backup for operation during periods when electricity is down or solar panels are not creating an electrical current, and a berm or other directional flow structure to guide the runoff to a sampling flume.

Before Situation:

The agricultural operation prior to installing the monitoring equipment is guessing about the effects of the conservation system with regards to meeting practice intent of avoid, controlling, or trapping sediment and nutrients.

After Situation:

The agricultural operation after installing the monitoring equipment will be receiving feedback in the form of edge-of-field runoff water quality samples. The samples will allow the operator to understand the relationship between rain/irrigation, practice choice, and nutrient inputs effecting nutrient and sediment loss for the field. Thus, providing an opportunity to make adaptive management changes to the agricultural operation to reduce sediment and nutrient loss and/or profitability.

Feature Measure: System installed

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $28,363.44

Scenario Cost/Unit: $28,363.44

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	60	$2,632.20
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	5	$557.25
Materials						
Solar Panels, fixed cost portion	1031	Fixed cost portion of the Solar Panels. This portion is a base cost for all Solar Panels and is not dependent on Kilowatt. The total cost of any Solar Panels will include this fixed cost plus a variable cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drops and etc.).	Each	$859.26	1	$859.26
Solar Panels, variable cost portion	1135	Variable cost portion of the Solar Panels. This portion IS dependent on the total Kilowatt for the Solar Panels. The total cost of Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drop, etc.). Includes materials only.	Kilowatt	$2,563.62	0.12	$307.63
Weather Station, Advanced	2550	Advance Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, temperature, and solar radiation from a solar powered self-standing tripod to an advance weather recording console. Used for both 449 advance irrigation water management and for Activity 202 water quality monitoring .	Each	$973.44	1	$973.44
Automated sampler with bottles and tubing	2606	Equipment used to collect the water samples on a flow weighted interval of 1.27 mm of runoff (volumetric depth) during a storm event.	Each	$2,555.63	1	$2,555.63
Connectors, cables, platform materials	2607	Miscellaneous (connectors, cables, berm, platform materials); Includes materials only.	Each	$9,638.96	1	$9,638.96
Depth (stage) sensor	2608	Device used to relay information to the Data logger about incremental increases in runoff. ISCO 730 Module with 1/8-in x 25-ft vinyl bubble line. Includes equipment only. Used for A202 water quality monitering	Each	$3,645.15	1	$3,645.15
Equipment shelter	2609	Building designed to house and reduce the risk of equipment damage from weather, animals, and vandalism.	Each	$1,734.29	1	$1,734.29
Pre-calibrated flow control structure-surface	2610	Pre-calibrated flow control structure-surface. Used for A202 water quality monitering	Each	$3,010.00	1	$3,010.00
Device, communications	2616	Piece of equipment or hardware designed to transmit real time data or information collected prior to site visits. Includes equipment only.	Each	$2,449.63	1	$2,449.63

Practice: 202 - Edge-of-Field Water Quality Monitoring-System Installation

Scenario: #73 - System Installation-Surface Cold Climate

Scenario Description:

This edge-of-field water quality monitoring system is applicable to a single control or treatment site that has a field defined with surface runoff that can be captured and sampled at the edge of a field before entering a ditch or receiving water body or water course. The component monitoring equipment are associated with a typical system for northern latitudes where winter time heating is required for sampling. It will allow for installation of automated sampling data collection system with protective housing to reduce potential for vandalism, battery backup for operation during periods when electricity is down or solar panels are not creating an electrical current, a calf hut or other structure with heat is required over the flume to allow sampling under northern latitude winter conditions, and a berm or other directional flow structure to guide the runoff to a sampling flume.

Before Situation:

The agricultural operation prior to installing the monitoring equipment is guessing about the effects of the conservation system with regards to meeting practice intent of avoid, controlling, or trapping sediment and nutrients. Nothing is known about the volume or mass of sediment and nutrients leaving the edge of field through the tile or other subsurface drainage system.

After Situation:

The agricultural operation after installing the monitoring equipment will be receiving feedback in the form of edge-of-field runoff water quality samples. The samples will allow the operator to understand the relationship between rain/irrigation, practice choice, and nutrient inputs effecting nutrient and sediment loss for the field. Thus, providing an opportunity to make adaptive management changes to the agricultural operation to reduce sediment and nutrient loss and/or profitability.

Feature Measure: System installed

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $29,153.51

Scenario Cost/Unit: $29,153.51

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	60	$2,632.20
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	5	$557.25
Materials						
Solar Panels, fixed cost portion	1031	Fixed cost portion of the Solar Panels. This portion is a base cost for all Solar Panels and is not dependent on Kilowatt. The total cost of any Solar Panels will include this fixed cost plus a variable cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drops and etc.).	Each	$859.26	1	$859.26
Solar Panels, variable cost portion	1135	Variable cost portion of the Solar Panels. This portion IS dependent on the total Kilowatt for the Solar Panels. The total cost of Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drop, etc.). Includes materials only.	Kilowatt	$2,563.62	0.12	$307.63
Heater, high efficiency	1165	Natural gas, propane, or fuel oil unit heater or boiler and venting materials. Based on input kBTU/hour. Includes materials and shipping only.	1,000 BTU/Hour	$22.00	1	$22.00
Weather Station, Advanced	2550	Advance Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, temperature, and solar radiation from a solar powered self-standing tripod to an advance weather recording console. Used for both 449 advance irrigation water management and for Activity 202 water quality monitoring .	Each	$973.44	1	$973.44
Automated sampler with bottles and tubing	2606	Equipment used to collect the water samples on a flow weighted interval of 1.27 mm of runoff (volumetric depth) during a storm event.	Each	$2,555.63	1	$2,555.63
Connectors, cables, platform materials	2607	Miscellaneous (connectors, cables, berm, platform materials); Includes materials only.	Each	$9,638.96	1	$9,638.96
Depth (stage) sensor	2608	Device used to relay information to the Data logger about incremental increases in runoff. ISCO 730 Module with 1/8-in x 25-ft vinyl bubble line. Includes equipment only. Used for A202 water quality monitering	Each	$3,645.15	1	$3,645.15
Equipment shelter	2609	Building designed to house and reduce the risk of equipment damage from weather, animals, and vandalism.	Each	$1,734.29	1	$1,734.29

Pre-calibrated flow control structure-surface	2610	Pre-calibrated flow control structure-surface. Used for A202 water quality monitering	Each	$3,010.00	1	$3,010.00
Device, communications	2616	Piece of equipment or hardware designed to transmit real time data or information collected prior to site visits. Includes equipment only.	Each	$2,449.63	1	$2,449.63
Equipment Shed	2617	Equipment shed (10 x 10 foot) made of steel applied over the sampling flume to allow collection of water samples during the winter in colder climates.	Each	$768.07	1	$768.07

Practice: 202 - Edge-of-Field Water Quality Monitoring-System Installation

Scenario: #74 - System Installation-Tile

Scenario Description:

This edge-of-field water quality monitoring system is applicable to a single control or treatment site that has a field defined with tile or other subsurface drainage runoff that can be captured and sampled at the edge of a field before entering a ditch or receiving water body or water course. The component monitoring equipment are associated with a typical system for southern latitudes where winter time heating is not required for sampling. It will allow for installation of automated sampling data collection system for a subsurface collection and separate surface automated sample collection system with protective housing to reduce potential for vandalism, battery backup for operation during periods when electricity is down or solar panels are not creating an electrical current, an area velocity sensor for pipe flow and estimation of submerged flow, and a berm or other directional flow structure to guide the runoff to a sampling flume.

Before Situation:

The agricultural operation prior to installing the monitoring equipment is guessing about the effects of the conservation system with regards to meeting practice intent of avoid, controlling, or trapping sediment and nutrients. Nothing is known about the volume or mass of sediment and nutrients leaving the edge of field through the tile or other subsurface drainage system.

After Situation:

The agricultural operation after installing the monitoring equipment will be receiving feedback in the form of edge-of-field runoff water quality samples. The samples will allow the operator to understand the relationship between rain/irrigation, practice choice, and nutrient inputs effecting nutrient and sediment loss for the field. Thus, providing an opportunity to make adaptive management changes to the agricultural operation to reduce sediment and nutrient loss and/or profitability.

Feature Measure: System installed

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $39,960.91

Scenario Cost/Unit: $39,960.91

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	100	$4,387.00
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	6	$668.70
Materials						
Solar Panels, fixed cost portion	1031	Fixed cost portion of the Solar Panels. This portion is a base cost for all Solar Panels and is not dependent on Kilowatt. The total cost of any Solar Panels will include this fixed cost plus a variable cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drops and etc.).	Each	$859.26	1	$859.26
Solar Panels, variable cost portion	1135	Variable cost portion of the Solar Panels. This portion IS dependent on the total Kilowatt for the Solar Panels. The total cost of Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drop, etc.). Includes materials only.	Kilowatt	$2,563.62	0.12	$307.63
Heater, high efficiency	1165	Natural gas, propane, or fuel oil unit heater or boiler and venting materials. Based on input kBTU/hour. Includes materials and shipping only.	1,000 BTU/Hour	$22.00	1	$22.00
Weather Station, Advanced	2550	Advance Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, temperature, and solar radiation from a solar powered self-standing tripod to an advance weather recording console. Used for both 449 advance irrigation water management and for Activity 202 water quality monitoring .	Each	$973.44	1	$973.44
Automated sampler with bottles and tubing	2606	Equipment used to collect the water samples on a flow weighted interval of 1.27 mm of runoff (volumetric depth) during a storm event.	Each	$2,555.63	2	$5,111.26
Connectors, cables, platform materials	2607	Miscellaneous (connectors, cables, berm, platform materials); Includes materials only.	Each	$9,638.96	1	$9,638.96
Depth (stage) sensor	2608	Device used to relay information to the Data logger about incremental increases in runoff. ISCO 730 Module with 1/8-in x 25-ft vinyl bubble line. Includes equipment only. Used for A202 water quality monitering	Each	$3,645.15	2	$7,290.30
Equipment shelter	2609	Building designed to house and reduce the risk of equipment damage from weather, animals, and vandalism.	Each	$1,734.29	2	$3,468.58

Pre-calibrated flow control structure-surface	2610	Pre-calibrated flow control structure-surface. Used for A202 water quality monitering	Each	$3,010.00	1	$3,010.00
Pre-calibrated flow control structure-subsurface (pipe flow)	2615	Equipment used to collect runoff for ease in measure of flow, sample collection and to reduce time in constructing and calibrating of a flow structure.	Each	$1,006.08	1	$1,006.08
Device, communications	2616	Piece of equipment or hardware designed to transmit real time data or information collected prior to site visits. Includes equipment only.	Each	$2,449.63	1	$2,449.63
Equipment Shed	2617	Equipment shed (10 x 10 foot) made of steel applied over the sampling flume to allow collection of water samples during the winter in colder climates.	Each	$768.07	1	$768.07

Practice: 202 - Edge-of-Field Water Quality Monitoring-System Installation

Scenario: #75 - System Installation-Tile Cold Climate

Scenario Description:

This edge-of-field water quality monitoring system is applicable to a single control or treatment site that has a field defined with tile or other subsurface drainage runoff that can be captured and sampled at the edge of a field before entering a ditch or receiving water body or water course. The component monitoring equipment are associated with a typical system for northern latitudes where winter time heating is required for sampling. It will allow for installation of automated sampling data collection system for a subsurface collection and separate surface automated sample collection system with protective housing to reduce potential for vandalism, battery backup for operation during periods when electricity is down or solar panels are not creating an electrical current, an area velocity sensor for pipe flow and estimation of submerged flow, a calf hut or other structure with heat is required over the flume to allow sampling under northern latitude winter conditions and a berm or other directional flow structure to guide the runoff to a sampling flume.

Before Situation:

The agricultural operation prior to installing the monitoring equipment is guessing about the effects of the conservation system with regards to meeting practice intent of avoid, controlling, or trapping sediment and nutrients. Nothing is known about the volume or mass of sediment and nutrients leaving the edge of field through the tile or other subsurface drainage system.

After Situation:

The agricultural operation after installing the monitoring equipment will be receiving feedback in the form of edge-of-field runoff water quality samples. The samples will allow the operator to understand the relationship between rain/irrigation, practice choice, and nutrient inputs effecting nutrient and sediment loss for the field. Thus, providing an opportunity to make adaptive management changes to the agricultural operation to reduce sediment and nutrient loss and/or profitability.

Feature Measure: System installed

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $39,960.91

Scenario Cost/Unit: $39,960.91

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	100	$4,387.00
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	6	$668.70
Materials						
Solar Panels, fixed cost portion	1031	Fixed cost portion of the Solar Panels. This portion is a base cost for all Solar Panels and is not dependent on Kilowatt. The total cost of any Solar Panels will include this fixed cost plus a variable cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drops and etc.).	Each	$859.26	1	$859.26
Solar Panels, variable cost portion	1135	Variable cost portion of the Solar Panels. This portion IS dependent on the total Kilowatt for the Solar Panels. The total cost of Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drop, etc.). Includes materials only.	Kilowatt	$2,563.62	0.12	$307.63
Heater, high efficiency	1165	Natural gas, propane, or fuel oil unit heater or boiler and venting materials. Based on input kBTU/hour. Includes materials and shipping only.	1,000 BTU/Hour	$22.00	1	$22.00
Weather Station, Advanced	2550	Advance Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, temperature, and solar radiation from a solar powered self-standing tripod to an advance weather recording console. Used for both 449 advance irrigation water management and for Activity 202 water quality monitoring .	Each	$973.44	1	$973.44
Automated sampler with bottles and tubing	2606	Equipment used to collect the water samples on a flow weighted interval of 1.27 mm of runoff (volumetric depth) during a storm event.	Each	$2,555.63	2	$5,111.26
Connectors, cables, platform materials	2607	Miscellaneous (connectors, cables, berm, platform materials); Includes materials only.	Each	$9,638.96	1	$9,638.96
Depth (stage) sensor	2608	Device used to relay information to the Data logger about incremental increases in runoff. ISCO 730 Module with 1/8-in x 25-ft vinyl bubble line. Includes equipment only. Used for A202 water quality monitering	Each	$3,645.15	2	$7,290.30
Equipment shelter	2609	Building designed to house and reduce the risk of equipment damage from weather, animals, and vandalism.	Each	$1,734.29	2	$3,468.58

Pre-calibrated flow control structure-surface	2610	Pre-calibrated flow control structure-surface. Used for A202 water quality monitering	Each	$3,010.00	1	$3,010.00
Pre-calibrated flow control structure-subsurface (pipe flow)	2615	Equipment used to collect runoff for ease in measure of flow, sample collection and to reduce time in constructing and calibrating of a flow structure.	Each	$1,006.08	1	$1,006.08
Device, communications	2616	Piece of equipment or hardware designed to transmit real time data or information collected prior to site visits. Includes equipment only.	Each	$2,449.63	1	$2,449.63
Equipment Shed	2617	Equipment shed (10 x 10 foot) made of steel applied over the sampling flume to allow collection of water samples during the winter in colder climates.	Each	$768.07	1	$768.07

Practice: 202 - Edge-of-Field Water Quality Monitoring-System Installation

Scenario: #76 - System Installation-Above And Below

Scenario Description:

This edge-of-field water quality monitoring system is applicable where a conservation practice has a pre- and post treatment area in the same field drainage with surface or subsurface drainage runoff that can be captured and sampled at the edge of a field before entering a ditch or receiving water body or water course. The component monitoring equipment are associated with a typical system for southern latitudes where winter time heating is not required for sampling. It will allow for installation of automated sampling data collection system with protective housing to reduce potential for vandalism, battery backup for operation during periods when electricity is down or solar panels are not creating an electrical current, and a berm or other directional flow structure to guide the runoff to a sampling flume. The actual installation will different on the subsurface flow by allowing a smaller precalibrated flume with the addition of a velocity sensor meter as in the tile alternative.

Before Situation:

The agricultural operation prior to installing the monitoring equipment is guessing about the effects of the conservation system with regards to meeting practice intent of avoid, controlling, or trapping sediment and nutrients.

After Situation:

The agricultural operation after installing the monitoring equipment will be receiving feedback in the form of edge-of-field runoff water quality samples. The samples will allow the operator to understand the relationship between rain/irrigation, practice choice, and nutrient inputs effecting nutrient and sediment loss for the field. Thus, providing an opportunity to make adaptive management changes to the agricultural operation to reduce sediment and nutrient loss and/or profitability.

Feature Measure: System installed

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $39,419.96

Scenario Cost/Unit: $39,419.96

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	60	$2,632.20
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	6	$668.70
Materials						
Solar Panels, fixed cost portion	1031	Fixed cost portion of the Solar Panels. This portion is a base cost for all Solar Panels and is not dependent on Kilowatt. The total cost of any Solar Panels will include this fixed cost plus a variable cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drops and etc.).	Each	$859.26	1	$859.26
Solar Panels, variable cost portion	1135	Variable cost portion of the Solar Panels. This portion IS dependent on the total Kilowatt for the Solar Panels. The total cost of Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drop, etc.). Includes materials only.	Kilowatt	$2,563.62	0.12	$307.63
Weather Station, Advanced	2550	Advance Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, temperature, and solar radiation from a solar powered self-standing tripod to an advance weather recording console. Used for both 449 advance irrigation water management and for Activity 202 water quality monitoring .	Each	$973.44	1	$973.44
Automated sampler with bottles and tubing	2606	Equipment used to collect the water samples on a flow weighted interval of 1.27 mm of runoff (volumetric depth) during a storm event.	Each	$2,555.63	2	$5,111.26
Connectors, cables, platform materials	2607	Miscellaneous (connectors, cables, berm, platform materials); Includes materials only.	Each	$9,638.96	1	$9,638.96
Depth (stage) sensor	2608	Device used to relay information to the Data logger about incremental increases in runoff. ISCO 730 Module with 1/8-in x 25-ft vinyl bubble line. Includes equipment only. Used for A202 water quality monitering	Each	$3,645.15	2	$7,290.30
Equipment shelter	2609	Building designed to house and reduce the risk of equipment damage from weather, animals, and vandalism.	Each	$1,734.29	2	$3,468.58
Pre-calibrated flow control structure-surface	2610	Pre-calibrated flow control structure-surface. Used for A202 water quality monitering	Each	$3,010.00	2	$6,020.00
Device, communications	2616	Piece of equipment or hardware designed to transmit real time data or information collected prior to site visits. Includes equipment only.	Each	$2,449.63	1	$2,449.63

Practice: 202 - Edge-of-Field Water Quality Monitoring-System Installation

Scenario: #77 - System Installation-Above And Below cold climate

Scenario Description:

This edge-of-field water quality monitoring system is applicable where a conservation practice has a pre- and post treatment area in the same field drainage with surface or subsurface drainage runoff that can be captured and sampled at the edge of a field before entering a ditch or receiving water body or water course. The component monitoring equipment are associated with a typical system for northern latitudes where winter time heating is required for sampling. It will allow for installation of automated sampling data collection system with protective housing to reduce potential for vandalism, battery backup for operation during periods when electricity is down or solar panels are not creating an electrical current, a calf hut or other structure with heat is required over the flume to allow sampling under northern latitude winter conditions, and a berm or other directional flow structure to guide the runoff to a sampling flume. The actual installation will different on the subsurface flow by allowing a smaller pre-calibrated flume with the addition of a velocity sensor meter as in the tile alternative.

Before Situation:

The agricultural operation prior to installing the monitoring equipment is guessing about the effects of the conservation system with regards to meeting practice intent of avoid, controlling, or trapping sediment and nutrients. Nothing is known about the volume or mass of sediment and nutrients leaving the edge of field through the tile or other subsurface drainage system.

After Situation:

The agricultural operation after installing the monitoring equipment will be receiving feedback in the form of edge-of-field runoff water quality samples. The samples will allow the operator to understand the relationship between rain/irrigation, practice choice, and nutrient inputs effecting nutrient and sediment loss for the field. Thus, providing an opportunity to make adaptive management changes to the agricultural operation to reduce sediment and nutrient loss and/or profitability.

Feature Measure: System installed

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $43,449.73

Scenario Cost/Unit: $43,449.73

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	60	$2,632.20
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	6	$668.70
Materials						
Solar Panels, fixed cost portion	1031	Fixed cost portion of the Solar Panels. This portion is a base cost for all Solar Panels and is not dependent on Kilowatt. The total cost of any Solar Panels will include this fixed cost plus a variable cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drops and etc.).	Each	$859.26	1	$859.26
Solar Panels, variable cost portion	1135	Variable cost portion of the Solar Panels. This portion IS dependent on the total Kilowatt for the Solar Panels. The total cost of Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drop, etc.). Includes materials only.	Kilowatt	$2,563.62	0.12	$307.63
Heater, high efficiency	1165	Natural gas, propane, or fuel oil unit heater or boiler and venting materials. Based on input kBTU/hour. Includes materials and shipping only.	1,000 BTU/Hour	$22.00	2	$44.00
Weather Station, Advanced	2550	Advance Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, temperature, and solar radiation from a solar powered self-standing tripod to an advance weather recording console. Used for both 449 advance irrigation water management and for Activity 202 water quality monitoring .	Each	$973.44	1	$973.44
Automated sampler with bottles and tubing	2606	Equipment used to collect the water samples on a flow weighted interval of 1.27 mm of runoff (volumetric depth) during a storm event.	Each	$2,555.63	2	$5,111.26
Connectors, cables, platform materials	2607	Miscellaneous (connectors, cables, berm, platform materials); Includes materials only.	Each	$9,638.96	1	$9,638.96
Depth (stage) sensor	2608	Device used to relay information to the Data logger about incremental increases in runoff. ISCO 730 Module with 1/8-in x 25-ft vinyl bubble line. Includes equipment only. Used for A202 water quality monitering	Each	$3,645.15	2	$7,290.30
Equipment shelter	2609	Building designed to house and reduce the risk of equipment damage from weather, animals, and vandalism.	Each	$1,734.29	2	$3,468.58

Pre-calibrated flow control structure-surface	2610	Pre-calibrated flow control structure-surface. Used for A202 water quality monitering	Each	$3,010.00	2	$6,020.00
Device, communications	2616	Piece of equipment or hardware designed to transmit real time data or information collected prior to site visits. Includes equipment only.	Each	$2,449.63	2	$4,899.26
Equipment Shed	2617	Equipment shed (10 x 10 foot) made of steel applied over the sampling flume to allow collection of water samples during the winter in colder climates.	Each	$768.07	2	$1,536.14

Practice: 202 - Edge-of-Field Water Quality Monitoring-System Installation

Scenario: #78 - System Installation-Retrofit 1

Scenario Description:

This edge-of-field water quality monitoring system is to retrofit an existing system that is being used in associated with the 799 interim practice or comparable system. The retrofit is applicable to a single control or treatment site that has a field defined with surface or subsurface drainage runoff that can be captured and sampled at the edge of a field before entering a ditch or receiving water body or water course. The data represents the installation of an automated and manual backup rain gauge and back-up/solar power supply be added to existing system.

Before Situation:

The agricultural operation prior to retrofit has an edge-of-field data collection system but it does not meet the present standards for accuracy or reliability as detailed in either or both of Activity 201 and Activity 202.

After Situation:

The agricultural operation after installing the monitoring equipment will be receiving feedback in the form of edge-of-field runoff water quality samples. The samples will allow the operator to understand the relationship between rain/irrigation, practice choice, and nutrient inputs effecting nutrient and sediment loss for the field. Thus, providing an opportunity to make adaptive management changes to the agricultural operation to reduce sediment and nutrient loss and/or profitability.

Feature Measure: System installed

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $3,399.50

Scenario Cost/Unit: $3,399.50

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	16	$701.92
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	5	$557.25
Materials						
Solar Panels, fixed cost portion	1031	Fixed cost portion of the Solar Panels. This portion is a base cost for all Solar Panels and is not dependent on Kilowatt. The total cost of any Solar Panels will include this fixed cost plus a variable cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drops and etc.).	Each	$859.26	1	$859.26
Solar Panels, variable cost portion	1135	Variable cost portion of the Solar Panels. This portion IS dependent on the total Kilowatt for the Solar Panels. The total cost of Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drop, etc.). Includes materials only.	Kilowatt	$2,563.62	0.12	$307.63
Weather Station, Advanced	2550	Advance Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, temperature, and solar radiation from a solar powered self-standing tripod to an advance weather recording console. Used for both 449 advance irrigation water management and for Activity 202 water quality monitoring .	Each	$973.44	1	$973.44

Practice: 202 - Edge-of-Field Water Quality Monitoring-System Installation

Scenario: #79 - System Installation-Retrofit 2

Scenario Description:

This edge-of-field water quality monitoring system is to retrofit an existing system that is being used in associated with the 799 interim practice or comparable system. The retrofit is applicable to a single control or treatment site that has a field defined with surface or subsurface drainage runoff that can be captured and sampled at the edge of a field before entering a ditch or receiving water body or water course. The data represents the installation of an automated and manual backup rain gauge, back-up/solar power supply, communications device, and depth (stage) sensor to be added to existing system.

Before Situation:

The agricultural operation prior to retrofit has an edge-of-field data collection system but it does not meet the present standards for accuracy or reliability as detailed in either or both of Activity 201 and Activity 202.

After Situation:

The agricultural operation after installing the monitoring equipment will be receiving feedback in the form of edge-of-field runoff water quality samples. The samples will allow the operator to understand the relationship between rain/irrigation, practice choice, and nutrient inputs effecting nutrient and sediment loss for the field. Thus, providing an opportunity to make adaptive management changes to the agricultural operation to reduce sediment and nutrient loss and/or profitability.

Feature Measure: System installed

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $9,669.76

Scenario Cost/Unit: $9,669.76

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	20	$877.40
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	5	$557.25
Materials						
Solar Panels, fixed cost portion	1031	Fixed cost portion of the Solar Panels. This portion is a base cost for all Solar Panels and is not dependent on Kilowatt. The total cost of any Solar Panels will include this fixed cost plus a variable cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drops and etc.).	Each	$859.26	1	$859.26
Solar Panels, variable cost portion	1135	Variable cost portion of the Solar Panels. This portion IS dependent on the total Kilowatt for the Solar Panels. The total cost of Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drop, etc.). Includes materials only.	Kilowatt	$2,563.62	0.12	$307.63
Weather Station, Advanced	2550	Advance Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, temperature, and solar radiation from a solar powered self-standing tripod to an advance weather recording console. Used for both 449 advance irrigation water management and for Activity 202 water quality monitoring .	Each	$973.44	1	$973.44
Depth (stage) sensor	2608	Device used to relay information to the Data logger about incremental increases in runoff. ISCO 730 Module with 1/8-in x 25-ft vinyl bubble line. Includes equipment only. Used for A202 water quality monitering	Each	$3,645.15	1	$3,645.15
Device, communications	2616	Piece of equipment or hardware designed to transmit real time data or information collected prior to site visits. Includes equipment only.	Each	$2,449.63	1	$2,449.63

Practice: 202 - Edge-of-Field Water Quality Monitoring-System Installation

Scenario: #80 - System Installation-Retrofit 3

Scenario Description:

This edge-of-field water quality monitoring system is to retrofit an existing system that is being used in associated with the 799 interim practice or comparable system. The retrofit is applicable to a single control or treatment site that has a field defined with surface or subsurface drainage runoff that can be captured and sampled at the edge of a field before entering a ditch or receiving water body or water course. The data represents the installation of an automated and manual backup rain gauge, back-up/solar power supply, communications device, pre-calibrated flow control structure, and depth (stage) sensor to be added to existing system.

Before Situation:

The agricultural operation prior to retrofit has an edge-of-field data collection system but it does not meet the present standards for accuracy or reliability as detailed in either or both of Activity 201 and Activity 202.

After Situation:

The agricultural operation after installing the monitoring equipment will be receiving feedback in the form of edge-of-field runoff water quality samples. The samples will allow the operator to understand the relationship between rain/irrigation, practice choice, and nutrient inputs effecting nutrient and sediment loss for the field. Thus, providing an opportunity to make adaptive management changes to the agricultural operation to reduce sediment and nutrient loss and/or profitability.

Feature Measure: System installed

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $13,206.20

Scenario Cost/Unit: $13,206.20

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	32	$1,403.84
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	5	$557.25
Materials						
Solar Panels, fixed cost portion	1031	Fixed cost portion of the Solar Panels. This portion is a base cost for all Solar Panels and is not dependent on Kilowatt. The total cost of any Solar Panels will include this fixed cost plus a variable cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drops and etc.).	Each	$859.26	1	$859.26
Solar Panels, variable cost portion	1135	Variable cost portion of the Solar Panels. This portion IS dependent on the total Kilowatt for the Solar Panels. The total cost of Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drop, etc.). Includes materials only.	Kilowatt	$2,563.62	0.12	$307.63
Weather Station, Advanced	2550	Advance Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, temperature, and solar radiation from a solar powered self-standing tripod to an advance weather recording console. Used for both 449 advance irrigation water management and for Activity 202 water quality monitoring .	Each	$973.44	1	$973.44
Depth (stage) sensor	2608	Device used to relay information to the Data logger about incremental increases in runoff. ISCO 730 Module with 1/8-in x 25-ft vinyl bubble line. Includes equipment only. Used for A202 water quality monitering	Each	$3,645.15	1	$3,645.15
Pre-calibrated flow control structure-surface	2610	Pre-calibrated flow control structure-surface. Used for A202 water quality monitering	Each	$3,010.00	1	$3,010.00
Device, communications	2616	Piece of equipment or hardware designed to transmit real time data or information collected prior to site visits. Includes equipment only.	Each	$2,449.63	1	$2,449.63

Practice: 202 - Edge-of-Field Water Quality Monitoring-System Installation

Scenario: #81 - System Installation-Retrofit Above and Below 1

Scenario Description:

This edge-of-field water quality monitoring system is to retrofit an existing above and below monitoring designed system that is being used in associated with the 799 interim practice or comparable system. The retrofit is applicable to an above and below system that has a field defined with surface or subsurface drainage runoff that can be captured and sampled at the edge of a field before entering a ditch or receiving water body or water course. The data represents the installation of an automated and manual backup rain gauge and two back-up/solar power supply be added to existing paired system.

Before Situation:

The agricultural operation prior to retrofit has an edge-of-field data collection system but it does not meet the present standards for accuracy or reliability as detailed in either or both of Activity 201 and Activity 202.

After Situation:

The agricultural operation after installing the monitoring equipment will be receiving feedback in the form of edge-of-field runoff water quality samples. The samples will allow the operator to understand the relationship between rain/irrigation, practice choice, and nutrient inputs effecting nutrient and sediment loss for the field. Thus, providing an opportunity to make adaptive management changes to the agricultural operation to reduce sediment and nutrient loss and/or profitability.

Feature Measure: System installed

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $4,409.06

Scenario Cost/Unit: $4,409.06

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	32	$1,403.84
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	5	$557.25
Materials						
Solar Panels, fixed cost portion	1031	Fixed cost portion of the Solar Panels. This portion is a base cost for all Solar Panels and is not dependent on Kilowatt. The total cost of any Solar Panels will include this fixed cost plus a variable cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drops and etc.).	Each	$859.26	1	$859.26
Solar Panels, variable cost portion	1135	Variable cost portion of the Solar Panels. This portion IS dependent on the total Kilowatt for the Solar Panels. The total cost of Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drop, etc.). Includes materials only.	Kilowatt	$2,563.62	0.24	$615.27
Weather Station, Advanced	2550	Advance Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, temperature, and solar radiation from a solar powered self-standing tripod to an advance weather recording console. Used for both 449 advance irrigation water management and for Activity 202 water quality monitoring .	Each	$973.44	1	$973.44

Practice: 202 - Edge-of-Field Water Quality Monitoring-System Installation

Scenario: #83 - System Installation-Retrofit Above 3

Scenario Description:

This edge-of-field water quality monitoring system is to retrofit an existing above and below monitoring designed system that is being used in associated with the 799 interim practice or comparable system. The retrofit is applicable to an above and below system that has a field defined with surface or subsurface drainage runoff that can be captured and sampled at the edge of a field before entering a ditch or receiving water body or water course. The data represents the installation of an automated and manual backup rain gauge, two back-up/solar power supplies, two communications devices, two pre-calibrated flumes, and two depth (stage) sensors to be added to existing paired system.

Before Situation:

The agricultural operation prior to retrofit has an edge-of-field data collection system but it does not meet the present standards for accuracy or reliability as detailed in either or both of Activity 201 and Activity 202.

After Situation:

The agricultural operation after installing the monitoring equipment will be receiving feedback in the form of edge-of-field runoff water quality samples. The samples will allow the operator to understand the relationship between rain/irrigation, practice choice, and nutrient inputs effecting nutrient and sediment loss for the field. Thus, providing an opportunity to make adaptive management changes to the agricultural operation to reduce sediment and nutrient loss and/or profitability.

Feature Measure: System installed

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $23,081.03

Scenario Cost/Unit: $23,081.03

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	40	$1,754.80
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	6	$668.70
Materials						
Solar Panels, fixed cost portion	1031	Fixed cost portion of the Solar Panels. This portion is a base cost for all Solar Panels and is not dependent on Kilowatt. The total cost of any Solar Panels will include this fixed cost plus a variable cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drops and etc.).	Each	$859.26	1	$859.26
Solar Panels, variable cost portion	1135	Variable cost portion of the Solar Panels. This portion IS dependent on the total Kilowatt for the Solar Panels. The total cost of Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drop, etc.). Includes materials only.	Kilowatt	$2,563.62	0.24	$615.27
Weather Station, Advanced	2550	Advance Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, temperature, and solar radiation from a solar powered self-standing tripod to an advance weather recording console. Used for both 449 advance irrigation water management and for Activity 202 water quality monitoring .	Each	$973.44	1	$973.44
Depth (stage) sensor	2608	Device used to relay information to the Data logger about incremental increases in runoff. ISCO 730 Module with 1/8-in x 25-ft vinyl bubble line. Includes equipment only. Used for A202 water quality monitering	Each	$3,645.15	2	$7,290.30
Pre-calibrated flow control structure-surface	2610	Pre-calibrated flow control structure-surface. Used for A202 water quality monitering	Each	$3,010.00	2	$6,020.00
Device, communications	2616	Piece of equipment or hardware designed to transmit real time data or information collected prior to site visits. Includes equipment only.	Each	$2,449.63	2	$4,899.26

Practice: 206 - Feed and Forage Analysis

Scenario: #5 - Feed or Forage Nutrient Composition Analysis

Scenario Description:

Testing of feed or forage for nutrient composition. Each lot (forage lot or lot of feed) should be sampled and tested separately.Testing of bale or stack forage for nutrient composition. Factors to consider when determining lot size include forage species, stage of maturity, cutting schedule, soil type, soil fertility, presence of weeds, harvest conditions, storage effects. Each lot should be sampled and tested separately.Testing of standing forage for nutrient composition. Forage can be tested to determine if it is worth cutting for hay or to determine if grazing animals require supplemental feed. Select at lease eight representative locations and clip the forage at grazing or harvest height from a one square foot area at each location. In grazing situations try and select the species being selectively grazed. Cut the samples into 2- to 3-inch pieces, combine in a bucket and mix well. Spread the sample on paper and allow it to air-dry for two days or place in a pan and dry overnight in an oven at 150??F before mailing it to the laboratory.Analysis of silage (fresh or silo) for nutrient composition. Remove two to three gallons of silage from different sections of a load and save about a quart using the quartering method. Freeze the samples until all loads are sampled. Combine samples, mix thoroughly, and reduce to about one quart by quartering. The final sample should be placed in the cloth forage sample bag, and the full forage bag inserted into a plastic bag to prevent moisture loss during mailing. Remove excess air from the plastic bag before sealing. Do not insert the plastic bag inside the cloth forage bag since damage may result when it is processed by the laboratory. Freeze the sample prior to mailing and mail samples early in the week to avoid weekend delays and reduce chances of molding. Upright silos- 12 handfuls of silage as it is discharged from the silo. Horizontal silos-hand grab same as upright but access the entire surface of the open face.Analysis of dietary ration, feed, or diet for nutrient composition.

Before Situation:

Producer wishes to reduce nutrient excretion or emission from livestock or poultry to air, soil, or water. To accomplish a reduction in nutrient excretion and emissions, knowledge of nutrient input from silage is required to optimally balance the diet for best nutrient utilization by the animal.

After Situation:

Animal diet is optimally balanced for nutrient composition and nutrients excreted or emitted by the animal are reduced.

Feature Measure: Each

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $2,069.13

Scenario Cost/Unit: $2,069.13

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Portable Post Driver	2722	Gas or Hydraulic Powered Post Driver, Portable, <300 lbs, labor not included	Hours	$17.49	1	$17.49
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	12	$344.52
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	12	$1,337.40
Materials						
Test, Feed Analysis	1989	Representative sample of feed. Includes materials and shipping only.	Each	$30.81	12	$369.72

Practice: 207 - Site Assessment and Soil Testing for Contaminants Activity

Scenario: #5 - Site Evaluation for Potential Contaminants

Scenario Description:
This practice applies to urban sites where the desired land use is cropland. Sites may have been residential, industrial or commercial land use in the past and the risk for soil contaminants is unknown.

Before Situation:
Soil suitability for agricultural production is unknown with potential risk of contamination from prior land use activities.

After Situation:
Site history has been researched and findings indicate a potential for the presence of contaminants. Final report provides the landowner with the level of risk and recommendation for further testing. Reports may be used in the conservation planning process to explore non-remedial conservation practices to reduce risk of contaminants entering the food products.

Feature Measure: Each Site

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $4,458.00

Scenario Cost/Unit: $4,458.00

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	40	$4,458.00

Practice: 207 - Site Assessment and Soil Testing for Contaminants Activity

Scenario: #21 - Site Evaluation and Soil Testing for Contaminants

Scenario Description:
This practice applies to urban sites where the desired land use is cropland. Sites may have been residential, industrial or commercial land use in the past and the risk for soil contaminants is unknown.

Before Situation:
Soil suitability for agricultural production is unknown with potential risk of contamination from prior land use activities.

After Situation:
Site history has been researched and findings indicate a potential for the presence of contaminants. The soil has been collected and tested for heavy metals, VOCs and PAHs. Final reports provide the landowner with the level of risk. Reports may be used in the conservation planning process to explore non-remedial conservation practices to reduce risk of contaminants entering the food products.

Feature Measure: Each Site

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $13,374.00

Scenario Cost/Unit: $13,374.00

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	120	$13,374.00

Practice: 207 - Site Assessment and Soil Testing for Contaminants Activity

Scenario: #37 - Soil Testing and Subsurface Investigation

Scenario Description:

This practice applies to urban sites where the desired land use is cropland. Sites may have been residential, industrial or commercial land use in the past and the risk for soil contaminants is unknown. The landowner has a prior Environmental Site Assessment completed by an Environmental Professional. The ESA report recommends further subsurface investigation. OR Landowner has NRCS report from portable Xray Flouresence screening that detected soil contaminants.

Before Situation:

Soil suitability for agricultural production is unknown with potential risk of contamination from prior land use activities.

After Situation:

Site history has been researched and findings indicate a potential for the presence of contaminants. The soil has been collected and tested for heavy metals, VOCs and PAHs. Final reports provide the landowner with the level of risk. Reports may be used in the conservation planning process to explore non-remedial conservation practices to reduce risk of contaminants entering the food products.

Feature Measure: Each Site

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $8,916.00

Scenario Cost/Unit: $8,916.00

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	80	$8,916.00

Practice: 207 - Site Assessment and Soil Testing for Contaminants Activity

Scenario: #53 - Soil Testing for Contaminants on Low Risk Sites

Scenario Description:

This practice applies to urban sites where the desired land use is cropland. Sites may have been residential, industrial or commercial land use in the past and the risk for soil contaminants is unknown. The landowner has a prior Environmental Site Assessment completed by an Environmental Professional. The ESA report does not require further investigation. OR Landowner has NRCS report from portable Xray Flouresence screening that detected soil contaminants. Screening detection levels are below the State Environmental Protection Agency or equivalent agency published safety thresholds for bare soil residential use.

Before Situation:

Soil suitability for agricultural production is unknown with potential risk of contamination from prior land use activities.

After Situation:

Site history has been researched and findings indicate a potential for the presence of contaminants. The soil has been collected and tested for heavy metals only. Soil test reports provide the landowner with the level of risk. Reports may be used in the conservation planning process to explore non-remedial conservation practices to reduce risk of contaminants entering the food products.

Feature Measure: Area of Soil Tested

Scenario Unit: 1,000 Square Foot

Scenario Typical Size: 4.00

Scenario Total Cost: $780.70

Scenario Cost/Unit: $195.18

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	10	$287.10
Materials						
Test, Soil Test, Heavy Metals	2735	Microwave assisted acid digestion of soil for arsenic, cadmium, chromium, copper, lead, molybdenum, nickel, selenium, and zinc using EPA Method 3051A	Number	$123.40	4	$493.60

Practice: 209 - PFAS Testing in Water or Soil

Scenario: #5 - PFAS Testing: Simple (Low Complexity) Sampling - Single Sample

Scenario Description:
A single sample of water or soil is required to provide prescreening information to the landowner to determine if PFAS may be present in water or soils at their operation.

In this scenario, the environmental media being sampled by the qualified individual is of low complexity: there is little temporal or spatial variation to account for in sampling, therefore no pre-sampling planning needed. This could include a single well used for stockwater or irrigation systems. The typical number of tests is 1, assuming that a landowner has a single well or a single field that can be represented by a single composite sample.

Before Situation:
Water or soil on an agricultural operation are of unknown PFAS status. PFAS laboratory analysis has not been conducted on the water or soil of interest.

After Situation:
A laboratory PFAS analysis was completed, and the results were interpreted and explained to the landowner. The landowner now has pre-screening information that suggests if PFAS may be present in water (or soil) on their operation. If testing detects PFAS in water or soil at levels that exceed State or Federal screening levels, the landowner can decide to pursue non-NRCS sources for follow-up detailed PFAS assessment.

Feature Measure: Each

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $1,217.70

Scenario Cost/Unit: $1,217.70

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	6	$668.70
Materials						
PFAS Laboratory Testing in Water and Soils	2801	This component supports data collection on PFAS in soil and water. Soil or water samples are to be collected by trained environmental professionals to be analyzed using the appropriate EPA protocol at an accredited laboratory for PFAS. Includes testing and shipping costs.	Number	$549.00	1	$549.00

Practice: 209 - PFAS Testing in Water or Soil

Scenario: #21 - PFAS Testing: Simple (Low Complexity) Sampling - Multiple Samples

Scenario Description:

Multiple samples of water or soil are needed to provide prescreening information to the landowner to determine if PFAS may be present in water or soils at their operation. In this scenario, the environmental media being sampled by the qualified individual is of low complexity. There is little temporal or spatial variation to account for in sampling, therefore no pre-sampling planning needed. This scenario could apply to small ponds or wells used for stockwater or irrigation systems, a small field, or a small number of fields of uniform soil composition. This scenario assumes that additional time is needed for each collection of multiple samples. The typical number of tests is 5, assuming that a landowner has four fields and a well and each field can be represented by a single composite sample.

Before Situation:

Water or soil on an agricultural operation are of unknown PFAS status. PFAS laboratory analysis has not been conducted on the water or soil of interest.

After Situation:

A laboratory PFAS analysis was completed, and the results were interpreted and explained to the landowner. The landowner now has pre-screening information that suggests if PFAS may be present in water (or soil) on their operation. If testing detects PFAS in water or soil at levels that exceed State or Federal screening levels, the landowner can decide to pursue non-NRCS sources for follow-up detailed PFAS assessment.

Feature Measure: Each

Scenario Unit: Number

Scenario Typical Size: 5.00

Scenario Total Cost: $4,305.30

Scenario Cost/Unit: $861.06

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	14	$1,560.30
Materials						
PFAS Laboratory Testing in Water and Soils	2801	This component supports data collection on PFAS in soil and water. Soil or water samples are to be collected by trained environmental professionals to be analyzed using the appropriate EPA protocol at an accredited laboratory for PFAS. Includes testing and shipping costs.	Number	$549.00	5	$2,745.00

Practice: 209 - PFAS Testing in Water or Soil

Scenario: #37 - PFAS Testing: Complicated (High Complexity) Sampling - Multiple Samples

Scenario Description:

Multiple samples of water or soil are needed to provide prescreening information to the landowner to determine if PFAS may be present in water or soils at their operation. In this scenario, the environmental media being sampled is of high complexity. There is a need to account for this temporal or spatial variation in sampling. Therefore, additional time is needed to prepare and discuss a comprehensive sampling strategy to detect PFAS and the final comprehensive report with the landowner. This scenario could apply to the agricultural use of multiple sources of water (ponds, wells, and reclaimed water) for stockwater or irrigation systems or to assess multiple fields with variable soil composition. This scenario assumes that additional time is needed for each collection of multiple samples. The typical number of tests is 5, assuming that a farmer has many fields, and the producer doesn't want to test all or has large fields with highly variable soil composition.

Before Situation:

Water or soil on an agricultural operation are of unknown PFAS status. PFAS laboratory analysis has not been conducted on the water or soil of interest.

After Situation:

A laboratory PFAS analysis was completed, and the results were interpreted and explained to the landowner. The landowner now has pre-screening information that suggests if PFAS may be present in water (or soil) on their operation. If testing detects PFAS in water or soil at levels that exceed State or Federal screening levels, the landowner can decide to pursue non-NRCS sources for follow-up detailed PFAS assessment.

Feature Measure: Each

Scenario Unit: Number

Scenario Typical Size: 5.00

Scenario Total Cost: $5,196.90

Scenario Cost/Unit: $1,039.38

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	22	$2,451.90
Materials						
PFAS Laboratory Testing in Water and Soils	2801	This component supports data collection on PFAS in soil and water. Soil or water samples are to be collected by trained environmental professionals to be analyzed using the appropriate EPA protocol at an accredited laboratory for PFAS. Includes testing and shipping costs.	Number	$549.00	5	$2,745.00

Practice: 216 - Soil Health Testing

Scenario: #152 - Basic Soil Health Suite + Chemical

Scenario Description:

Soil is collected and analyzed in a lab to assess soil health and fertility. A laboratory soil health assessment is conducted to evaluate and/or monitor conservation practices. Laboratory tests must include 'basic package' indicators: soil organic carbon, aggregation, bioavailable nitrogen, respiration, and active carbon. This scenario also includes a comprehensive chemical soil test (macronutrients + micronutrients). One basic soil health assessment is planned for on Soil Health Management Unit (SHMU). Sample collection is completed by an agricultural service provider, soil scientist, or other agriculture professional and includes time for soil sampling and submission.

Before Situation:

Agricultural producer has been farming a system that has not addressed all 4 of the soil health principles. Producer has noticed yield declines, soil degradation, or is simply interested in learning more about soil health management.

After Situation:

A laboratory soil health test and nutrient analysis were completed, and the results were interpreted and explained to the producer and used to establish benchmark conditions for soil health management practices or evaluate the effectiveness of a conservation practice.

Feature Measure: polygon

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $361.47

Scenario Cost/Unit: $361.47

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, Skilled	1604	Conservation Activity Plan labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$39.97	4.5	$179.87
Materials						
Test, Soil Test, Comprehensive	2384	Comprehensive Soil Testing for pH, EC, nitrates, ammonium, phosphorus, potassium, organic matter and other micro-nutrients. Includes materials and shipping only.	Each	$55.45	1	$55.45
Test, Soil Health, Basic Package	2734	Basic soil health laboratory assessment for soil organic carbon, aggregation, bioavailable nitrogen, respiration, and active carbon according to technical note 450-03. Includes shipping and handling.	Number	$126.15	1	$126.15

Practice: 216 - Soil Health Testing

Scenario: #168 - Basic Soil Health Suite

Scenario Description:

A soil sample is collected, and laboratory soil health assessment is conducted to evaluate and/or monitor conservation practices. Laboratory tests must include 'basic package' indicators: soil organic carbon, aggregation, bioavailable nitrogen, respiration, and active carbon. One basic soil health assessment is planned for on Soil Health Management Unit (SHMU). This scenario assumes that a comprehensive chemical soil test (macronutrients + micronutrients) has been completed on the same management unit in the last 2 years. Sample collection is completed by an agricultural service provider, soil scientist, or other agriculture professional and includes time for soil sampling and submission.

Before Situation:

Agricultural producer has been farming a system that has not addressed all 4 of the soil health principles. Producer has noticed yield declines, soil degradation, or is simply interested in learning more about soil health management.

After Situation:

A laboratory soil health test was completed and the results were interpreted (scored), explained to the producer, and used to establish benchmark conditions for soil health management practices or to evaluate the effectiveness of a conservation practice.

Feature Measure: polygon

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $306.02

Scenario Cost/Unit: $306.02

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, Skilled	1604	Conservation Activity Plan labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$39.97	4.5	$179.87
Materials						
Test, Soil Health, Basic Package	2734	Basic soil health laboratory assessment for soil organic carbon, aggregation, bioavailable nitrogen, respiration, and active carbon according to technical note 450-03. Includes shipping and handling.	Number	$126.15	1	$126.15

Practice: 216 - Soil Health Testing

Scenario: #184 - Single Indicator

Scenario Description:

A laboratory soil health assessment for a single indictor is conducted to evaluate and/or monitor conservation practices. Laboratory tests for the single indicator may include soil organic carbon, aggregation, bioavailable nitrogen, respiration, active carbon, microbial community structure, enzyme activity or other soil health test. One basic soil health assessment is planned for on Soil Health Management Unit (SHMU). Sample collection is completed by a Qualified Individual and includes time for soil sampling and submission.

Before Situation:

Agricultural producer has been farming a system that has not addressed all 4 of the soil health principles. Producer has noticed yield declines, soil degradation, or is simply interested in learning more about soil health management.

After Situation:

A laboratory soil health test of was completed for a single indicator and the results were interpreted and explained to the producer and used to establish benchmark conditions for soil health management practices or evaluate the effectiveness of a conservation practice.

Feature Measure: polygon

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $243.02

Scenario Cost/Unit: $243.02

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, Skilled	1604	Conservation Activity Plan labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$39.97	4.5	$179.87
Materials						
Testing, Soil Health Single Indicator	2795	Single soil health laboratory assessment for soil organic carbon, aggregation, bioavailable nitrogen, respiration, active carbon, microbial activity, or microbial diversity according to technical note 450-03 or standard laboratory methods. Includes shipping and handling.	Each	$63.15	1	$63.15

Practice: 216 - Soil Health Testing

Scenario: #273 - Three Indicator Soil Health Measurement

Scenario Description:
A laboratory soil health assessment to measure three soil health indicators. The indicators are soil organic carbon measured by dry combustion lab methods, carbon mineralization potential measured by 24 hour carbon dioxide from rewetting air dry soils, and aggregate stability measured by the wet sieve 10 minute change slake test.

Before Situation:
Agricultural producer has been farming a system that has not addressed all 4 of the soil health principles. Producer has noticed yield declines, soil degradation, or is simply interested in learning more about soil health management.

After Situation:
A laboratory soil health test of was completed to measure the three soil health indicators and the results were interpreted (scored) and explained to the producer and used to establish benchmark conditions for soil health management practices or evaluate the effectiveness of a conservation practice.

Feature Measure: soil health indicator

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $369.32

Scenario Cost/Unit: $369.32

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, Skilled	1604	Conservation Activity Plan labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$39.97	4.5	$179.87
Materials						
Testing, Soil Health Single Indicator	2795	Single soil health laboratory assessment for soil organic carbon, aggregation, bioavailable nitrogen, respiration, active carbon, microbial activity, or microbial diversity according to technical note 450-03 or standard laboratory methods. Includes shipping and handling.	Each	$63.15	3	$189.45

Practice: 217 - Soil and Source Testing for Nutrient Management

Scenario: #5 - Soil Test Only

Scenario Description:

A qualified individual will develop a nutrient testing strategy, collect soil samples and prepare for laboratory analysis; and interpret soil nutrient needs. Typical management unit is 100 acres. Includes Comprehensive Soil Testing to provide both Macro and micro soil nutrient levels.

Before Situation:

Producer does not have soil test laboratory analysis documenting the level of nitrogen, phosphorus, potassium or pH for each field or management unit in crop production. Nutrients are applied without knowledge of soil test levels.

After Situation:

Soil samples have been collected and analyzed. The strategy for sampling is described and a map if sampling points is provided. Qualified individual concludes nutrients are needed or not based on soil test results. Follow up by developing a nutrient management plan with DIA 157 Nutrient Management Design and Implementation Activity or implement Nutrient Management 590.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $915.13

Scenario Cost/Unit: $915.13

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	4	$175.48
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	6	$668.70
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$14.19	5	$70.95

Practice: 217 - Soil and Source Testing for Nutrient Management

Scenario: #21 - Soil and Source Material Test

Scenario Description:
A qualified individual will develop a nutrient testing strategy, collect soil samples and prepare for laboratory analysis; and interpret soil nutrient needs. Typical whole field soil sampling plus collection of samples for nutrient sources needing to be tested.

Before Situation:
Producer does not have soil test laboratory analysis documenting the level of nitrogen, phosphorus, potassium or pH for each field or management unit in crop production. Nutrients are applied without knowledge of soil test levels.

After Situation:
Soil samples have been collected and analyzed. The strategy for sampling is described and a map if sampling points is provided. Qualified individual concludes nutrients are needed or not based on soil test results. Follow up by developing a nutrient management plan with DIA 157 Nutrient Management Design and Implementation Activity or implement Nutrient Management 590.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $3,625.25

Scenario Cost/Unit: $3,625.25

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	8	$350.96
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	25	$2,786.25
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$14.19	20	$283.80
Test, Manure Analysis	306	Moisture, Total N, P, K. Includes materials and shipping only.	Each	$48.54	1.3	$63.10
Test, Compost Analysis	307	Moisture, Total N, P, K. Includes materials and shipping only.	Each	$59.82	1.3	$77.77
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration ??? Preferred, or Total Suspended Solids. Includes materials only.	Each	$48.75	1.3	$63.38

Practice: 217 - Soil and Source Testing for Nutrient Management

Scenario: #37 - Zone or Grid Soil Test

Scenario Description:
A qualified individual will develop a nutrient testing strategy, collect soil samples based on a 2.5 acre grid or zone, and prepare for laboratory analysis; and interpret soil nutrient needs. Typical management unit is 100 acres.

Before Situation:
Producer does not have soil test laboratory analysis documenting the level of nitrogen, phosphorus, potassium or pH for each field or management unit in crop production. Nutrients are applied without knowledge of soil test levels.

After Situation:
Soil samples have been collected and analyzed. The strategy for sampling is described and a map if sampling points is provided. Qualified individual concludes nutrients are needed or not based on soil test results. Follow up by developing a nutrient management plan with DIA 157 Nutrient Management Design and Implementation Activity or implement Nutrient Management 590.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $1,810.16

Scenario Cost/Unit: $1,810.16

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	8	$350.96
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	8	$891.60
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$14.19	40	$567.60

Practice: 217 - Soil and Source Testing for Nutrient Management

Scenario: #53 - Manure or Compost Only

Scenario Description:

A qualified individual will develop a nutrient testing strategy, collect manure or compost samples and prepare for laboratory analysis; and interpret crop nutrient needs. Sampling protocol for liquid manure includes agitation per LGU guidelines. Dry manure and compost sampling protocol are performed per LGU guidelines.

Before Situation:

Producer does not have manure or compost laboratory analysis documenting the level of nitrogen, phosphorus, potassium or pH of the organic source. Nutrients are applied without knowledge of manure or compost nutrient levels.

After Situation:

Manure or Compost samples have been collected and analyzed. The strategy for sampling is described. Qualified individual concludes the amount of nutrients needed for the crop based on manure or compost test results. Follow up by developing a nutrient management plan with DIA 157 Nutrient Management Design and Implementation Activity or implement Nutrient Management 590.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $1,083.46

Scenario Cost/Unit: $1,083.46

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	4	$175.48
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	6	$668.70
Materials						
Test, Compost Analysis	307	Moisture, Total N, P, K. Includes materials and shipping only.	Each	$59.82	4	$239.28

Practice: 217 - Soil and Source Testing for Nutrient Management

Scenario: #69 - Source Water Nutrient Test

Scenario Description:

A qualified individual will develop a nutrient testing strategy, collect source water samples and prepare for laboratory analysis; and interpret crop nutrient needs. Typical irrigation water sampling for nutrients, may include drainage water sampling for monitoring nutrient loss or if drainage water is being reused.

Before Situation:

Producer does not have Source Water Nutrient laboratory analysis documenting the level of nitrogen, phosphorus, potassium or pH of the water source. Nutrients are applied without knowledge of source water nutrient levels.

After Situation:

Water samples have been collected and analyzed. The strategy for sampling is described. Qualified individual concludes the amount of nutrients needed for the crop based on Source Water test results. Follow up by developing a nutrient management plan with DIA 157 Nutrient Management Design and Implementation Activity or implement Nutrient Management 590.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $816.28

Scenario Cost/Unit: $816.28

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	4	$175.48
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	4	$445.80
Materials						
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration ??? Preferred, or Total Suspended Solids. Includes materials only.	Each	$48.75	4	$195.00

Practice: 217 - Soil and Source Testing for Nutrient Management

Scenario: #85 - Soil Test- pH Emphasis

Scenario Description:

Soil analysis is used as a diagnostic tool to identify fields with soil acidification problems in no-till cropping systems. One soil sample is collected every 40 acres from only the top 3 inches of soil and analyzed for both pH and buffer pH. A recommended three cores should be taken from a 4 sq ft sampling area every 40 acres and composited to provide at least 100 grams of soil for the laboratory test. Test results are georeferenced on a map and can be used to build a lime application budget for the field.

Before Situation:

Field shows crop yield decline and areas of lower pH are suspected but not tested. No-till application of nitrogen fertilizers is causing acidification. Soil is sampled to 6-inch depth, multiple sub-samples are collected from random locations in the field and are composited into one main sample, diluting potential low pH results from the top 3-inches of soil. Samples are submitted to the lab to determine pH level in the soil. Fertilizer and liming recommendations are made based on the one composited sample for the whole field.

After Situation:

One composited soil sample is collected in a 4 sq ft area from the top 3 inches of soil every 40 acres,. The sample is analyzed for pH and buffer pH. Sample results are georeferenced on a map and and used to identify and diagnose soil acidification problems. Follow up by developing or updating a nutrient management plan with DIA 157 Nutrient Management Design and Implementation Activity or implement Nutrient Management 590. Producers can then use this diagnostic information to apply lime to raise the soil pH. Topsoil pH and plant productivity and health are both maintained at desirable levels.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $286.87

Scenario Cost/Unit: $286.87

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	4	$175.48
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	2	$97.20
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$14.19	1	$14.19

Practice: 217 - Soil and Source Testing for Nutrient Management

Scenario: #101 - Small scale - Soil and Nutrient Source Test

Scenario Description:

A qualified individual will develop a nutrient testing strategy, collect soil and nutrient source samples, prepare for laboratory analysis and interpret soil and crop nutrient needs. Typical field size is less than or equal to 0.5 acres (22000 sq ft). Includes Comprehensive Soil Testing to provide both Macro and micro soil nutrient levels.

Before Situation:

Producer does not have soil and nutrient source laboratory analysis documenting the level of nitrogen, phosphorus, potassium or pH for the soil and nutrient source. Nutrients are applied without knowledge of soil and nutrient source test levels.

After Situation:

Soil and nutrient source samples have been collected and analyzed. The strategy for sampling is described. Qualified individual concludes nutrients are needed or not based on soil test results. The amount of nutrients needed is based on Nutrient Source results. Follow up by developing a nutrient management plan with DIA 157 Nutrient Management Design and Implementation Activity or implement Nutrient Management 590.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $469.02

Scenario Cost/Unit: $469.02

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	2	$87.74
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	2	$222.90
Materials						
Test, Manure Analysis	306	Moisture, Total N, P, K. Includes materials and shipping only.	Each	$48.54	0.5	$24.27
Test, Compost Analysis	307	Moisture, Total N, P, K. Includes materials and shipping only.	Each	$59.82	0.5	$29.91
Test, Soil Test, Comprehensive	2384	Comprehensive Soil Testing for pH, EC, nitrates, ammonium, phosphorus, potassium, organic matter and other micro-nutrients. Includes materials and shipping only.	Each	$55.45	1	$55.45
Testing, Water Quality	2613	Ammonium, Nitrite plus Nitrate, Total Kjeldahl Nitrogen, Soluble Reactive P (Orthophosphate), Total Phosphorus, Suspended Sediment Concentration ??? Preferred, or Total Suspended Solids. Includes materials only.	Each	$48.75	1	$48.75

Practice: 217 - Soil and Source Testing for Nutrient Management

Scenario: #117 - Soil Test Only Garden Plots/Raised Beds

Scenario Description:
A qualified individual will develop a nutrient testing strategy, collect 5 soil subsamples and combine to one representative sample, prepare for laboratory analysis, and interpret soil nutrient needs. This scenario considers costs for 5 or less raised beds. Cost includes comprehensive soil test based on expected specialty crop production.

Before Situation:
Producer does not have soil test laboratory analysis documenting the level of nitrogen, phosphorus, potassium or pH for each field or management unit in crop production. Nutrients are applied without knowledge of soil test levels.

After Situation:
Soil samples have been collected and analyzed. The strategy for sampling is described and a map if sampling points is provided. Qualified individual concludes nutrients are needed or not based on soil test results. A Nutrient Management Plan CPS 590 or DIA 157 may be developed after the report is complete.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $587.89

Scenario Cost/Unit: $587.89

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	2	$87.74
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	2	$222.90
Materials						
Test, Soil Test, Comprehensive	2384	Comprehensive Soil Testing for pH, EC, nitrates, ammonium, phosphorus, potassium, organic matter and other micro-nutrients. Includes materials and shipping only.	Each	$55.45	5	$277.25

Practice: 218 - Carbon Sequestration and Greenhouse Gas Mitigation Assessment

Scenario: #5 - Low Complexity

Scenario Description:

An evaluation of the quantifiable carbon sequestration and greenhouse gas mitigation effects using the COMET-Farm tool. The information on the type of operation, land use, and management history is collected initially as part of the planning process for a conservation plan focused on carbon sequestration and greenhouse gas mitigation. The carbon sequestration and greenhouse gas mitigation CEMA includes a complete COMET-Farm project designed to evaluate the current conservation plan and the baseline and historic management impacts on carbon sequestration and greenhouse gas mitigation. The COMET-Farm evaluation can occur concurrently or following a conservation plan. Low complexity would include simple systems of a single enterprise, low number of management units, detailed available history.

Before Situation:

The producer's objectives are to improve soil carbon sequestration and greenhouse gas mitigation and to quantify the effects of a conservation plan. The quantifiable effects on soil carbon sequestration and greenhouse gas mitigation of the current and historic management practices are not known.

After Situation:

Producer receives a detailed report from COMET-Farm that quantifies the soil carbon sequestration and greenhouse gas mitigation effects of historic, baseline, and (scenario management) proposed conservation plan.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $891.60

Scenario Cost/Unit: $891.60

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	8	$891.60

Practice: 218 - Carbon Sequestration and Greenhouse Gas Mitigation Assessment

Scenario: #21 - Medium Complexity

Scenario Description:

An evaluation of the quantifiable carbon sequestration and greenhouse gas mitigation effects using the COMET-Farm tool. The information on the type of operation, land use, and management history is collected initially as part of the planning process for a conservation plan focused on carbon sequestration and greenhouse gas mitigation. The carbon sequestration and greenhouse gas mitigation CEMA includes a complete COMET-Farm project designed to evaluate the current conservation plan and the baseline and historic management impacts on carbon sequestration and greenhouse gas mitigation. The COMET-Farm evaluation can occur concurrently or following a conservation plan. Medium complexity would include systems with more than one enterprises, a moderate number of management units, complex or difficult to define history.

Before Situation:

The producer objectives are to improve soil carbon sequestration and greenhouse gas mitigation and quantify the effects of a conservation plan. The quantifiable effects on soil carbon sequestration and greenhouse gas mitigation of the current and historic management practices are not known.

After Situation:

Producer receives a detailed COMET-Farm report that quantifies the soil carbon sequestration and greenhouse gas mitigation effects of historic, baseline, and (scenario management) proposed conservation plan.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $1,337.40

Scenario Cost/Unit: $1,337.40

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	12	$1,337.40

Practice: 218 - Carbon Sequestration and Greenhouse Gas Mitigation Assessment

Scenario: #37 - High Complexity

Scenario Description:

An evaluation of the quantifiable carbon sequestration and greenhouse gas mitigation effects using the COMET-Farm tool. The information on the type of operation, land use, and management history is collected initially as part of the planning process for a conservation plan focused on carbon sequestration and greenhouse gas mitigation. The carbon sequestration and greenhouse gas mitigation CEMA includes a complete COMET-Farm project designed to evaluate the current conservation plan and the baseline and historic management impacts on carbon sequestration and greenhouse gas mitigation. The COMET-Farm evaluation can occur concurrently or following a conservation plan. High complexity would include systems with multiple enterprises, high number of management units, and complex or incomplete management history.

Before Situation:

The producer objectives are to improve soil carbon sequestration and greenhouse gas mitigation and quantify the effects of a conservation plan. The quantifiable effects on soil carbon sequestration and greenhouse gas mitigation of the current and historic management practices are not known.

After Situation:

Producer receives a detailed report from COMET-Farm that quantifies the soil carbon sequestration and greenhouse gas mitigation effects of historic, baseline, and (scenario management) proposed conservation plan .

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $1,783.20

Scenario Cost/Unit: $1,783.20

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	16	$1,783.20

Practice: 219 - Prescribed Grazing Conservation Evaluation and Monitoring Activity

Scenario: #5 - Conservation, Evaluation and Monitoring Activity less than 100 acres

Scenario Description:

Small agricultural operation with less than 100 acres grazed land. Natural Resource Concern: soil erosion, water quality, fish and wildlife, plant condition, or approprite resource concerns.

Before Situation:

Producer is not utlizing a certified Technical Service Provider (TSP) to evaluate and monitor all practices planned in a Conservation Plan, CPA 110, Implentation Requirement (IR), and/or DIA 159. Information is not being gathered to evaluate the effectiveness of the grazing management plan (CPS 528) and any associated practices. A monitoring plan has not been developed to ascertain whether the stragegy(s) identified in the grazing management plan is resulting in a movement toward meeting goals and objectives; particularly regarding the pertinent resource concern assessments identified in the Conservation Plan or CPA. Evaluation and monitoring of CPS 528 and any supporting practices has not been conducted to determine effectiveness of implemented practices.

After Situation:

Producer will utilize a certified Technical Service Provider (TSP) to evaluate and monitor all grazing management practices planned in a Conservation Plan, CPA 110, Implementation Requirement (IR) and/or DIA 159. Evaluation and monitoring activities will provide all needed information to evaluate the effectiveness of the grazing management plan (CPS 528) and any associated practices. A monitoring plan will be implemented with appropriate protocols and data records that evaluate whether the grazing strategy identified in the grazing plan is resulting in a movement toward meeting goals and objectives. Specific evaluation activities will be chosen based on stated objectives and pertinent resource concerns assessments identified in the Conservation Plan, CPA, Implementation Requirement (IR) and/or DIA. Evaluation and monitoring will meet the applicable 'plans and specifications' and 'operation and maintenance' sections found in CPS 528. Other supporting and facilitating conservation practices will also be monitored and evaluated. The CEMA narrative will describe the overall methodology, decision support tools and recommended management actions to meet purposes and criteria within practice standards. Job sheets and implementation requirement documents found in State's FOTG Section IV Conservation practices may be used.

Feature Measure: number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $1,045.40

Scenario Cost/Unit: $1,045.40

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, range conservation	1299	Conservation Activity Plan labor to study, plan the use and management of rangelands to maximize their use in a sustainable manner. Range managers may inventory soils, plants, and animals; develop resource management plans; identify monitoring methods and collect data using those methods to determine if resource management objectives are being met or if adjustments to management activities are needed. For example, they may help ranchers attain optimum livestock production by determining the number and kind of animals to graze, the grazing system to use, and the best season for grazing. Cost associated with this component includes overhead and benefits (market price).	Hours	$104.54	10	$1,045.40

Practice: 219 - Prescribed Grazing Conservation Evaluation and Monitoring Activity

Scenario: #21 - Conservation, Evaluation and Monitoring Activity between 101 and 500 acres

Scenario Description:
Agricultural operation between 101 and 500 acres grazed land. Natural Resource Concern: soil erosion, water quality, fish and wildlife, plant condition, or appropriate resource concerns.

Before Situation:
Producer is not utlizing a certified Technical Service Provider (TSP) to evaluate and monitor all practices planned in a Conservation Plan, CPA 110, Implentation Requirement (IR), and/or DIA 159. Information is not being gathered to evaluate the effectiveness of the grazing management plan (CPS 528) and any associated practices. A monitoring plan has not been developed to ascertain whether the stragegy(s) identified in the grazing management plan is resulting in a movement toward meeting goals and objectives; particularly regarding the pertinent resource concern assessments identified in the Conservation Plan or CPA. Evaluation and monitoring of CPS 528 and any supporting practices has not been conducted to determine effectiveness of implemented practices.

After Situation:
Producer will utilize a certified Technical Service Provider (TSP) to evaluate and monitor all grazing managment practices planned in a Conservation Plan, CPA 110, Implementation Requirement (IR) and/or DIA 159. Evaluation and monitoring activities will provide all needed information to evaluate the effectiveness of the grazing management plan (CPS 528) and any associated practices. A monitoring plan will be implemented with appropriate protocols and data records that evaluate whether the grazing strategy identified in the grazing plan is resulting in a movement toward meeting goals and objectives. Specific evaluation activities will be chosen based on stated objectives and pertinent resource concerns assessments identified in the Conservation Plan, CPA, Implementation Requirment (IR) and/or DIA. Evaluation and monitoring will meet the applicable 'plans and specifications' and 'operation and maintenance' sections found in CPS 528. Other supporting and facilitating conservation practices will also be monitored and evaluated. The CEMA narrative will describe the overall methodology, decision support tools and recommended management actions to meet purposes and criteria within practice standards. Job sheets and implementation requirement documents found in State's FOTG Section IV Conservation practices may be used.

Feature Measure: number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $1,568.10

Scenario Cost/Unit: $1,568.10

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, range conservation	1299	Conservation Activity Plan labor to study, plan the use and management of rangelands to maximize their use in a sustainable manner. Range managers may inventory soils, plants, and animals; develop resource management plans; identify monitoring methods and collect data using those methods to determine if resource management objectives are being met or if adjustments to management activities are needed. For example, they may help ranchers attain optimum livestock production by determining the number and kind of animals to graze, the grazing system to use, and the best season for grazing. Cost associated with this component includes overhead and benefits (market price).	Hours	$104.54	15	$1,568.10

Practice: 219 - Prescribed Grazing Conservation Evaluation and Monitoring Activity

Scenario: #37 - Conservation, Evaluation and Monitoring Activity between 501 and 1,500 acres

Scenario Description:
Small agricultural operation with 501 to 1,500 acres grazed land. Natural Resource Concern: Soil erosion, water quality, fish and wildlife, plant condition, or appropriate resource concerns.

Before Situation:
Producer is not utilizing a certified Technical Service Provider (TSP) to evaluate and monitor all practices planned in a Conservation Plan, CPA 110, Implementation Requirement (IR), and/or DIA 159. Information is not being gathered to evaluate the effectiveness of the grazing management plan (CPS 528) and any associated practices. A monitoring plan has not been developed to ascertain whether the stragegy(s) identified in the grazing management plan is resulting in a movement toward meeting goals and objectives; particularly regarding the pertinent resource concern assessments identified in the Conservation Plan or CPA. Evaluation and monitoring of CPS 528 and any supporting practices has not been conducted to determine effectiveness of implemented practices.

After Situation:
Producer will utilize a certified Technical Service Provider (TSP) to evaluate and monitor all grazing management practices planned in a Conservation Plan, CPA 110, Implementation Requirement (IR) and/or DIA 159. Evaluation and monitoring activities will provide all needed information to evaluate the effectiveness of the grazing management plan (CPS 528) and any associated practices. A monitoring plan will be implemented with appropriate protocols and data records that evaluate whether the grazing strategy identified in the grazing plan is resulting in a movement toward meeting goals and objectives. Specific evaluation activities will be chosen based on stated objectives and pertinent resource concerns assessments identified in the Conservation Plan, CPA, Implementation Requirement (IR) and/or DIA. Evaluation and monitoring will meet the applicable 'plans and specifications' and 'operation and maintenance' sections found in CPS 528. Other supporting and facilitating conservation practices will also be monitored and evaluated. The CEMA narrative will describe the overall methodology, decision support tools and recommended management actions to meet purposes and criteria within practice standards. Job sheets and implementation requirement documents found in State's FOTG Section IV Conservation practices may be used.

Feature Measure: number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $2,613.50

Scenario Cost/Unit: $2,613.50

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, range conservation	1299	Conservation Activity Plan labor to study, plan the use and management of rangelands to maximize their use in a sustainable manner. Range managers may inventory soils, plants, and animals; develop resource management plans; identify monitoring methods and collect data using those methods to determine if resource management objectives are being met or if adjustments to management activities are needed. For example, they may help ranchers attain optimum livestock production by determining the number and kind of animals to graze, the grazing system to use, and the best season for grazing. Cost associated with this component includes overhead and benefits (market price).	Hours	$104.54	25	$2,613.50

Practice: 219 - Prescribed Grazing Conservation Evaluation and Monitoring Activity

Scenario: #53 - Conservation, Evaluation and Monitoring Activity between 1,501 and 5,000 acres

Scenario Description:
Agricultural operation with 1,501 to 5,000 acres grazed land. Natural Resource Concern: Soil erosion, water quality, fish and wildlife, plant condition, or appropriate resource concerns.

Before Situation:
Producer is not utilizing a certified Technical Service Provider (TSP) to evaluate and monitor all practices planned in a Conservation Plan, CPA 110, Implementation Requirement (IR), and/or DIA 159. Information is not being gathered to evaluate the effectiveness of the grazing management plan (CPS 528) and any associated practices. A monitoring plan has not been developed to ascertain whether the stragegy(s) identified in the grazing management plan is resulting in a movement toward meeting goals and objectives; particularly regarding the pertinent resource concern assessments identified in the Conservation Plan or CPA. Evaluation and monitoring of CPS 528 and any supporting practices has not been conducted to determine effectiveness of implemented practices.

After Situation:
Producer will utilize a certified Technical Service Provider (TSP) to evaluate and monitor all grazing management practices planned in a Conservation Plan, CPA 110, Implementation Requirement (IR) and/or DIA 159. Evaluation and monitoring activities will provide all needed information to evaluate the effectiveness of the grazing management plan (CPS 528) and any associated practices. A monitoring plan will be implemented with appropriate protocols and data records that evaluate whether the grazing strategy identified in the grazing plan is resulting in a movement toward meeting goals and objectives. Specific evaluation activities will be chosen based on stated objectives and pertinent resource concerns assessments identified in the Conservation Plan, CPA, Implementation Requirement (IR) and/or DIA. Evaluation and monitoring will meet the applicable 'plans and specifications' and 'operation and maintenance' sections found in CPS 528. Other supporting and facilitating conservation practices will also be monitored and evaluated. The CEMA narrative will describe the overall methodology, decision support tools and recommended management actions to meet purposes and criteria within practice standards. Job sheets and implementation requirement documents found in State's FOTG Section IV Conservation practices may be used.

Feature Measure: number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $3,658.90

Scenario Cost/Unit: $3,658.90

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, range conservation	1299	Conservation Activity Plan labor to study, plan the use and management of rangelands to maximize their use in a sustainable manner. Range managers may inventory soils, plants, and animals; develop resource management plans; identify monitoring methods and collect data using those methods to determine if resource management objectives are being met or if adjustments to management activities are needed. For example, they may help ranchers attain optimum livestock production by determining the number and kind of animals to graze, the grazing system to use, and the best season for grazing. Cost associated with this component includes overhead and benefits (market price).	Hours	$104.54	35	$3,658.90

Practice: 219 - Prescribed Grazing Conservation Evaluation and Monitoring Activity

Scenario: #69 - Conservation, Evaluation and Monitoring Activity between 5,001 and 10,000 acres

Scenario Description:
Agricultural operation with 5,001 to 10,000 acres grazed land. Natural Resource Concern: Soil erosion, water quality, fish and wildlife, plant condition, or appropriate resource concerns.

Before Situation:
Producer is not utilizing a certified Technical Service Provider (TSP) to evaluate and monitor all practices planned in a Conservation Plan, CPA 110, Implementation Requirement (IR), and/or DIA 159. Information is not being gathered to evaluate the effectiveness of the grazing management plan (CPS 528) and any associated practices. A monitoring plan has not been developed to ascertain whether the stragegy(s) identified in the grazing management plan is resulting in a movement toward meeting goals and objectives; particularly regarding the pertinent resource concern assessments identified in the Conservation Plan or CPA. Evaluation and monitoring of CPS 528 and any supporting practices has not been conducted to determine effectiveness of implemented practices.

After Situation:
Producer will utilize a certified Technical Service Provider (TSP) to evaluate and monitor all grazing management practices planned in a Conservation Plan, CPA 110, Implementation Requirement (IR) and/or DIA 159. Evaluation and monitoring activities will provide all needed information to evaluate the effectiveness of the grazing management plan (CPS 528) and any associated practices. A monitoring plan will be implemented with appropriate protocols and data records that evaluate whether the grazing strategy identified in the grazing plan is resulting in a movement toward meeting goals and objectives. Specific evaluation activities will be chosen based on stated objectives and pertinent resource concerns assessments identified in the Conservation Plan, CPA, Implementation Requirement (IR) and/or DIA. Evaluation and monitoring will meet the applicable 'plans and specifications' and 'operation and maintenance' sections found in CPS 528. Other supporting and facilitating conservation practices will also be monitored and evaluated. The CEMA narrative will describe the overall methodology, decision support tools and recommended management actions to meet purposes and criteria within practice standards. Job sheets and implementation requirement documents found in State's FOTG Section IV Conservation practices may be used.

Feature Measure: number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $4,704.30

Scenario Cost/Unit: $4,704.30

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, range conservation	1299	Conservation Activity Plan labor to study, plan the use and management of rangelands to maximize their use in a sustainable manner. Range managers may inventory soils, plants, and animals; develop resource management plans; identify monitoring methods and collect data using those methods to determine if resource management objectives are being met or if adjustments to management activities are needed. For example, they may help ranchers attain optimum livestock production by determining the number and kind of animals to graze, the grazing system to use, and the best season for grazing. Cost associated with this component includes overhead and benefits (market price).	Hours	$104.54	45	$4,704.30

Practice: 219 - Prescribed Grazing Conservation Evaluation and Monitoring Activity

Scenario: #85 - Conservation, Evaluation and Monitoring Activity greater than 10,000 acres

Scenario Description:
Agricultural operation with greater than 10,000 acres grazed land. Natural Resource Concern: Soil erosion, water quality, fish and wildlife, plant condition, or appropriate resource concerns.

Before Situation:
Producer is not utilizing a certified Technical Service Provider (TSP) to evaluate and monitor all practices planned in a Conservation Plan, CPA 110, Implementation Requirement (IR), and/or DIA 159. Information is not being gathered to evaluate the effectiveness of the grazing management plan (CPS 528) and any associated practices. A monitoring plan has not been developed to ascertain whether the stragegy(s) identified in the grazing management plan is resulting in a movement toward meeting goals and objectives; particularly regarding the pertinent resource concern assessments identified in the Conservation Plan or CPA. Evaluation and monitoring of CPS 528 and any supporting practices has not been conducted to determine effectiveness of implemented practices.

After Situation:
Producer will utilize a certified Technical Service Provider (TSP) to evaluate and monitor all grazing management practices planned in a Conservation Plan, CPA 110, Implementation Requirement (IR) and/or DIA 159. Evaluation and monitoring activities will provide all needed information to evaluate the effectiveness of the grazing management plan (CPS 528) and any associated practices. A monitoring plan will be implemented with appropriate protocols and data records that evaluate whether the grazing strategy identified in the grazing plan is resulting in a movement toward meeting goals and objectives. Specific evaluation activities will be chosen based on stated objectives and pertinent resource concerns assessments identified in the Conservation Plan, CPA, Implementation Requirement (IR) and/or DIA. Evaluation and monitoring will meet the applicable 'plans and specifications' and 'operation and maintenance' sections found in CPS 528. Other supporting and facilitating conservation practices will also be monitored and evaluated. The CEMA narrative will describe the overall methodology, decision support tools and recommended management actions to meet purposes and criteria within practice standards. Job sheets and implementation requirement documents found in State's FOTG Section IV Conservation practices may be used.

Feature Measure: number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $6,272.40

Scenario Cost/Unit: $6,272.40

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, range conservation	1299	Conservation Activity Plan labor to study, plan the use and management of rangelands to maximize their use in a sustainable manner. Range managers may inventory soils, plants, and animals; develop resource management plans; identify monitoring methods and collect data using those methods to determine if resource management objectives are being met or if adjustments to management activities are needed. For example, they may help ranchers attain optimum livestock production by determining the number and kind of animals to graze, the grazing system to use, and the best season for grazing. Cost associated with this component includes overhead and benefits (market price).	Hours	$104.54	60	$6,272.40

Practice: 221 - Soil Organic Carbon Stock Monitoring

Scenario: #5 - Carbon Stock Monitoring

Scenario Description:
Soil is collected for organic carbon testing to evaluate and monitor the change in soil carbon stocks before and after the implementation of a conservation practice or conservation plan An area of interest (AOI) of <20 acres is identified in a region that is relatively uniform and is representative of a larger management unit. There are no inclusions or small map units of dissimilar soils, and the topography and vegetation appear uniform. Soil samples are collected by a Qualified Individual (QI) from 4 different depths at 6 different locations within the AOI. Soil bulk density is measured before being analyzed for organic carbon by dry combustion. Payment includes time for soil sampling and sample preparation, submission to the laboratory, and interpretation/delivery of results.

Before Situation:
No recent measurements of soil organic carbon stocks have been made in the AOI. Conservation practices are planned or installed for the purpose of improving soil health and sequestering carbon.

After Situation:
Soil bulk density was measured before being analyzed for organic carbon by dry combustion. The results were interpreted and explained to the producer. Initial measurements are used to establish benchmark conditions for soil organic carbon stocks. Subsequent measurement are used to evaluate the effectiveness of a conservation practice on carbon sequestration and report the change over time.

Feature Measure: Area of Interest Polygon

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $2,377.29

Scenario Cost/Unit: $2,377.29

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	3	$76.08
Auger, Truck Mounted	2049	Truck mounted auger for large diameter excavation. Includes equipment and labor.	Hours	$113.27	3	$339.81
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	4	$445.80
Materials						
Testing, Soil Health Single Indicator	2795	Single soil health laboratory assessment for soil organic carbon, aggregation, bioavailable nitrogen, respiration, active carbon, microbial activity, or microbial diversity according to technical note 450-03 or standard laboratory methods. Includes shipping and handling.	Each	$63.15	24	$1,515.60

Practice: 221 - Soil Organic Carbon Stock Monitoring

Scenario: #37 - Carbon Stock Monitoring - Intensive Data Collection

Scenario Description:

Soil is collected for organic carbon testing following the measurement, monitoring, reporting and verification (MMRV) protocol. PODS land use and management information is collected and documented. Soil sample collection strategy is planned in an area of interest (AOI) of <10 acres. Soil samples are collected by a Qualified Individual (QI). Up to 3 soil map units will be sectioned into 3 with e sample holes/cores. Samples are collected at 4 depths. Soil bulk density is measured before being analyzed for organic carbon by dry combustion. Payment includes time for collecting management information, developing sampling strategy, soil sampling and sample preparation, submission to the laboratory, and interpretation/delivery of results.

Before Situation:

No recent measurements of soil organic carbon stocks have been made in the AOI. Conservation practices are planned or installed for the purpose of improving soil health and sequestering carbon.

After Situation:

Land use and management information is collected. Soil bulk density was measured before being analyzed for organic carbon by dry combustion. The results were interpreted and explained to the producer. Initial measurements are used to establish benchmark conditions for soil organic carbon stocks. Subsequent measurements are used to evaluate the effectiveness of a conservation practice on carbon sequestration and report the change over time.

Feature Measure: Area of Interest - Polygon

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $9,905.43

Scenario Cost/Unit: $9,905.43

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	11	$278.96
Auger, Truck Mounted	2049	Truck mounted auger for large diameter excavation. Includes equipment and labor.	Hours	$113.27	11	$1,245.97
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	14	$1,560.30
Materials						
Testing, Soil Health Single Indicator	2795	Single soil health laboratory assessment for soil organic carbon, aggregation, bioavailable nitrogen, respiration, active carbon, microbial activity, or microbial diversity according to technical note 450-03 or standard laboratory methods. Includes shipping and handling.	Each	$63.15	108	$6,820.20

Practice: 221 - Soil Organic Carbon Stock Monitoring

Scenario: #53 - Intensive Data Collection Carbon Monitoring 9

Scenario Description:

Soil is collected for organic carbon testing following the measurement, monitoring, reporting and verification (MMRV) protocol. PODS land use and management information is collected and documents. Soil sample collection strategy is planned in an area of interest (AOI) of <10 acres. Soil samples are collected by a Qualified Individual (QI) at 9 different locations within the AOI (3 locations in 3 different strata). Soil bulk density is measured before being analyzed for organic carbon by dry combustion. Payment includes time for collecting management information, developing sampling strategy, soil sampling and sample preparation, submission to the laboratory, and interpretation/delivery of results.

Before Situation:

No recent measurements of soil organic carbon stocks have been made in the AOI. Conservation practices are planned or installed for the purpose of improving soil health and sequestering carbon.

After Situation:

Land use and management information is collected. Soil bulk density was measured before being analyzed for organic carbon by dry combustion. The results were interpreted and explained to the producer. Initial measurements are used to establish benchmark conditions for soil organic carbon stocks. Subsequent measurement are used to evaluate the effectiveness of a conservation practice on carbon sequestration and report the change over time.

Feature Measure: per 9 samples collected

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $4,565.79

Scenario Cost/Unit: $4,565.79

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	9	$228.24
Auger, Truck Mounted	2049	Truck mounted auger for large diameter excavation. Includes equipment and labor.	Hours	$113.27	7	$792.89
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	3	$86.13
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	9	$1,003.05
Materials						
Testing, Soil Health Single Indicator	2795	Single soil health laboratory assessment for soil organic carbon, aggregation, bioavailable nitrogen, respiration, active carbon, microbial activity, or microbial diversity according to technical note 450-03 or standard laboratory methods. Includes shipping and handling.	Each	$63.15	36	$2,273.40
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08

Practice: 221 - Soil Organic Carbon Stock Monitoring

Scenario: #69 - Intensive Data Collection 12 Carbon Samples

Scenario Description:

Soil is collected for organic carbon testing following the measurement, monitoring, reporting and verification (MMRV) protocol. PODS land use and management information is collected and documents. Soil sample collection strategy is planned in an area of interest (AOI) of <10 acres. Soil samples are collected by a Qualified Individual (QI) at 12 different locations within the AOI). Soil bulk density is measured before being analyzed for organic carbon by dry combustion. Payment includes time for collecting management information, developing sampling strategy, soil sampling and sample preparation, submission to the laboratory, and interpretation/delivery of results.

Before Situation:

No recent measurements of soil organic carbon stocks have been made in the AOI. Conservation practices are planned or installed for the purpose of improving soil health and sequestering carbon.

After Situation:

Land use and management information is collected. Soil bulk density was measured before being analyzed for organic carbon by dry combustion. The results were interpreted and explained to the producer. Initial measurements are used to establish benchmark conditions for soil organic carbon stocks. Subsequent measurement are used to evaluate the effectiveness of a conservation practice on carbon sequestration and report the change over time.

Feature Measure: per 12 sample locations

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $5,641.67

Scenario Cost/Unit: $5,641.67

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	11	$278.96
Auger, Truck Mounted	2049	Truck mounted auger for large diameter excavation. Includes equipment and labor.	Hours	$113.27	9	$1,019.43
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	3	$86.13
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	11	$1,225.95
Materials						
Testing, Soil Health Single Indicator	2795	Single soil health laboratory assessment for soil organic carbon, aggregation, bioavailable nitrogen, respiration, active carbon, microbial activity, or microbial diversity according to technical note 450-03 or standard laboratory methods. Includes shipping and handling.	Each	$63.15	48	$3,031.20

Practice: 222 - Indigenous Stewardship Methods Evaluation

Scenario: #5 - ISME 301 to 1,000 Acres

Scenario Description:

The scenario involves obtaining assistance from a Qualified Individual, designated by the governing body of a Tribe or Indigenous culture, to evaluate the designated planning area, then gather knowledge about indigenous knowledge, and deliver results to the client and NRCS. The resulting information can be used to inform the conservation planning and implementation processes, meet the client's objectives by addressing one or more NRCS-recognized resource concerns using techniques that align with Tribal or Indigenous knowledge.

Before Situation:

Through the NRCS conservation planning process, a conservation planner has identified client objectives for addressing natural resource concerns (Soil, Water, Animals, Plants, Air + Energy) and socio-economic considerations such as increasing capacity for Indigenous people to develop sustainable food systems. A deeper understanding of the planning area's context for Indigenous people is desired and/or greater knowledge about Indigenous Stewardship Methods (ISM) for land stewardship are desired. A Qualified Individual (QI), designated by the governing body of a Tribe or Indigenous culture is available for the program participant to hire (separately from the NRCS program contract)to evaluate the land, gather Indigenous knowledge, and provide results to meet the client's objectives and support the conservation planning process.

After Situation:

The client hired a QI to provide the CEMA assistance. The QI has met with client and visited the planning area, in order to develop an understanding of its capabilities, limitations, and needs within a culturally appropriate context. Indigenous knowledge about the planning area has been gathered from sources approved by a Tribe or Indigenous culture. The QI verifies with the Tribe's or Indigenous culture's governing body, that the information gathered is accurate- then provides a report, map and other supporting documentation of their ISM evaluation of the planning area to the client; and a copy is shared with NRCS. In the future, the information this CEMA provides can assists the participant and the planner refine conservation objectives; and realize opportunities to incorporate Indigenous knowledge into a conservation plan and/or conservation practice implementations.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $16,904.38

Scenario Cost/Unit: $16,904.38

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	39	$989.04
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	40	$725.20
Labor						
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$85.82	177	$15,190.14

Practice: 222 - Indigenous Stewardship Methods Evaluation

Scenario: #21 - ISME 1001 to 3,000 Acres

Scenario Description:

The scenario involves obtaining assistance from a Qualified Individual, designated by the governing body of a Tribe or Indigenous culture, to evaluate the designated planning area, then gather knowledge about indigenous knowledge, and deliver results to the client and NRCS. The resulting information can be used to inform the conservation planning and implementation processes, meet the client's objectives by addressing one or more NRCS-recognized resource concerns using techniques that align with Tribal or Indigenous knowledge.

Before Situation:

Through the NRCS conservation planning process, a conservation planner has identified client objectives for addressing natural resource concerns (Soil, Water, Animals, Plants, Air + Energy) and socio-economic considerations such as increasing capacity for Indigenous people to develop sustainable food systems. A deeper understanding of the planning area's context for Indigenous people is desired and/or greater knowledge about Indigenous Stewardship Methods (ISM) for land stewardship are desired. A Qualified Individual (QI), designated by the governing body of a Tribe or Indigenous culture is available for the program participant to hire (separately from the NRCS program contract)to evaluate the land, gather Indigenous knowledge, and provide results to meet the client's objectives and support the conservation planing process.

After Situation:

The client hired a QI to provide the CEMA assistance. The QI has met with client and visited the planning area, in order to develop an understanding of its capabilities, limitations, and needs within a culturally appropriate context. Indigenous knowledge about the planning area has been gathered from sources approved by a Tribe or Indigenous culture. The QI verifies with the Tribe's or Indigenous culture's governing body, that the information gathered is accurate- then provides a report, map and other supporting documentation of their ISM evaluation of the planning area to the client; and a copy is shared with NRCS. In the future, the information this CEMA provides can assists the participant and the planner refine conservation objectives; and realize opportunities to incorporate Indigenous knowledge into a conservation plan and/or conservation practice implementations.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $22,502.00

Scenario Cost/Unit: $22,502.00

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	39	$989.04
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	60	$1,087.80
Labor						
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$85.82	238	$20,425.16

Practice: 222 - Indigenous Stewardship Methods Evaluation

Scenario: #37 - ISME Less Than or Equal to 10 Acres

Scenario Description:

The scenario involves obtaining assistance from a Qualified Individual, designated by the governing body of a Tribe or Indigenous culture, to evaluate the designated planning area, then gather knowledge about indigenous knowledge, and deliver results to the client and NRCS. The resulting information can be used to inform the conservation planning and implementation processes, meet the client's objectives by addressing one or more NRCS-recognized resource concerns using techniques that align with Tribal or Indigenous knowledge.

Before Situation:

Through the NRCS conservation planning process, a conservation planner has identified client objectives for addressing natural resource concerns (Soil, Water, Animals, Plants, Air + Energy) and socio-economic considerations such as increasing capacity for Indigenous people to develop sustainable food systems. A deeper understanding of the planning area's context for Indigenous people is desired and/or greater knowledge about Indigenous Stewardship Methods (ISM) for land stewardship are desired. A Qualified Individual (QI), designated by the governing body of a Tribe or Indigenous culture is available for the program participant to hire (separately from the NRCS program contract)to evaluate the land, gather Indigenous knowledge, and provide results to meet the client's objectives and support the conservation planing process.

After Situation:

The client hired a QI to provide the CEMA assistance. The QI has met with client and visited the planning area, in order to develop an understanding of its capabilities, limitations, and needs within a culturally appropriate context. Indigenous knowledge about the planning area has been gathered from sources approved by a Tribe or Indigenous culture. The QI verifies with the Tribe's or Indigenous culture's governing body, that the information gathered is accurate- then provides a report, map and other supporting documentation of their ISM evaluation of the planning area to the client; and a copy is shared with NRCS. In the future, the information this CEMA provides can assists the participant and the planner refine conservation objectives; and realize opportunities to incorporate Indigenous knowledge into a conservation plan and/or conservation practice implementations.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $6,824.80

Scenario Cost/Unit: $6,824.80

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	39	$989.04
Labor						
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$85.82	68	$5,835.76

Practice: 222 - Indigenous Stewardship Methods Evaluation

Scenario: #53 - ISME 11 to 300 Acres

Scenario Description:

The scenario involves obtaining assistance from a Qualified Individual, designated by the governing body of a Tribe or Indigenous culture, to evaluate the designated planning area, then gather knowledge about indigenous knowledge, and deliver results to the client and NRCS. The resulting information can be used to inform the conservation planning and implementation processes, meet the client's objectives by addressing one or more NRCS-recognized resource concerns using techniques that align with Tribal or Indigenous knowledge.

Before Situation:

Through the NRCS conservation planning process, a conservation planner has identified client objectives for addressing natural resource concerns (Soil, Water, Animals, Plants, Air + Energy) and socio-economic considerations such as increasing capacity for Indigenous people to develop sustainable food systems. A deeper understanding of the planning area's context for Indigenous people is desired and/or greater knowledge about Indigenous Stewardship Methods (ISM) for land stewardship are desired. A Qualified Individual (QI), designated by the governing body of a Tribe or Indigenous culture is available for the program participant to hire (separately from the NRCS program contract)to evaluate the land, gather Indigenous knowledge, and provide results to meet the client's objectives and support the conservation planing process.

After Situation:

The client hired a QI to provide the CEMA assistance. The QI has met with client and visited the planning area, in order to develop an understanding of its capabilities, limitations, and needs within a culturally appropriate context. Indigenous knowledge about the planning area has been gathered from sources approved by a Tribe or Indigenous culture. The QI verifies with the Tribe's or Indigenous culture's governing body, that the information gathered is accurate- then provides a report, map and other supporting documentation of their ISM evaluation of the planning area to the client; and a copy is shared with NRCS. In the future, the information this CEMA provides can assists the participant and the planner refine conservation objectives; and realize opportunities to incorporate Indigenous knowledge into a conservation plan and/or conservation practice implementations.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $9,102.04

Scenario Cost/Unit: $9,102.04

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	39	$989.04
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	12	$217.56
Labor						
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$85.82	92	$7,895.44

Practice: 223 - Forest Management Assessment

Scenario: #5 - CEMA less than or equal to 20 acres

Scenario Description:

Nonindustrial Private Forest Land with a forest management plan. Typical site is approximately 1 to 20 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

Before Situation:

The producer currently manages forested lands with an existing forest management plan. Resource concerns exist which are not addressed by a management plan. A Conservation Evaluation and Monitoring Activity is needed to provide a forest inventory to allow the producer to apply for financial assistance through EQIP or other programs to develop and implement needed conservation practices. Associated Practices: 472, 666, 654, 655,384, 394, 383, 379, 338, 381, 391, 791, 490, 612, 660, 311, 380, 314, 315.

After Situation:

After EQIP contract approval, participant has obtained services from a qualified individual for development of the Conservation Evaluation and Monitoring Activities (CEMA) - Forest Inventory. The CEMA criteria requires a forest inventory as a component of a forest management plan to determine current site condition and identify resource concerns. Additional CEMA criteria are detailed in the Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $845.90

Scenario Cost/Unit: $845.90

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, forester	1302	Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage.	Hours	$84.59	10	$845.90

Practice: 223 - Forest Management Assessment

Scenario: #21 - CEMA 21 to 100 acres

Scenario Description:

Nonindustrial Private Forest Land with a forest management plan. Typical site is approximately 21 to 100 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

Before Situation:

The producer currently manages forested lands with an existing forest management plan. Resource concerns exist which are not addressed by a management plan. A Conservation Evaluation and Monitoring Activity is needed to provide a forest inventory to allow the producer to apply for financial assistance through EQIP or other programs to develop and implement needed conservation practices. Associated Practices: 472, 666, 654, 655,384, 394, 383, 379, 338, 381, 391, 791, 490, 612, 660, 311, 380, 314, 315.

After Situation:

After EQIP contract approval, participant has obtained services from a qualified individual for development of the Conservation Evaluation and Monitoring Activities (CEMA) - Forest Inventory. The CEMA criteria requires a forest inventory as a component of a forest management plan to determine current site condition and identify resource concerns. Additional CEMA criteria are detailed in the Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $1,607.21

Scenario Cost/Unit: $1,607.21

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, forester	1302	Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage.	Hours	$84.59	19	$1,607.21

Practice: 223 - Forest Management Assessment

Scenario: #37 - CEMA 101 to 250 acres

Scenario Description:

Nonindustrial Private Forest Land with a forest management plan. Typical site is approximately 101 to 250 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

Before Situation:

The producer currently manages forested lands with an existing forest management plan. Resource concerns exist which are not addressed by a management plan. A Conservation Evaluation and Monitoring Activity is needed to provide a forest inventory to allow the producer to apply for financial assistance through EQIP or other programs to develop and implement needed conservation practices. Associated Practices: 472, 666, 654, 655,384, 394, 383, 379, 338, 381, 391, 791, 490, 612, 660, 311, 380, 314, 315.

After Situation:

After EQIP contract approval, participant has obtained services from a qualified individual for development of the Conservation Evaluation and Monitoring Activities (CEMA) - Forest Inventory. The CEMA criteria requires a forest inventory as a component of a forest management plan to determine current site condition and identify resource concerns. Additional CEMA criteria are detailed in the Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $3,045.24

Scenario Cost/Unit: $3,045.24

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, forester	1302	Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage.	Hours	$84.59	36	$3,045.24

Practice: 223 - Forest Management Assessment

Scenario: #53 - CEMA 251 to 500 acres

Scenario Description:

Nonindustrial Private Forest Land with a forest management plan. Typical site is approximately 251 to 500 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

Before Situation:

The producer currently manages forested lands with an existing forest management plan. Resource concerns exist which are not addressed by a management plan. A Conservation Evaluation and Monitoring Activity is needed to provide a forest inventory to allow the producer to apply for financial assistance through EQIP or other programs to develop and implement needed conservation practices. Associated Practices: 472, 666, 654, 655,384, 394, 383, 379, 338, 381, 391, 791, 490, 612, 660, 311, 380, 314, 315.

After Situation:

After EQIP contract approval, participant has obtained services from a qualified individual for development of the Conservation Evaluation and Monitoring Activities (CEMA) - Forest Inventory. The CEMA criteria requires a forest inventory as a component of a forest management plan to determine current site condition and identify resource concerns. Additional CEMA criteria are detailed in the Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $4,567.86

Scenario Cost/Unit: $4,567.86

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, forester	1302	Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage.	Hours	$84.59	54	$4,567.86

Practice: 223 - Forest Management Assessment

Scenario: #69 - CEMA 501 to 1000 acres

Scenario Description:

Nonindustrial Private Forest Land with a forest management plan. Typical site is approximately 501 to 1000 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

Before Situation:

The producer currently manages forested lands with an existing forest management plan. Resource concerns exist which are not addressed by a management plan. A Conservation Evaluation and Monitoring Activity is needed to provide a forest inventory to allow the producer to apply for financial assistance through EQIP or other programs to develop implement needed conservation practices. Associated Practices: 472, 666, 654, 655,384, 394, 383, 379, 338, 381, 391, 791, 490, 612, 660, 311, 380, 314, 315.

After Situation:

After EQIP contract approval, participant has obtained services from a qualified individual for development of the Conservation Evaluation and Monitoring Activities (CEMA) - Forest Inventory. The CEMA criteria requires a forest inventory as a component of a forest management plan to determine current site condition and identify resource concerns. Additional CEMA criteria are detailed in the Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $5,752.12

Scenario Cost/Unit: $5,752.12

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, forester	1302	Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage.	Hours	$84.59	68	$5,752.12

Practice: 223 - Forest Management Assessment

Scenario: #85 - CEMA Greater Than 1000 acres

Scenario Description:

Nonindustrial Private Forest Land with a forest management plan. Typical site is approximately 1001 acres or greater in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

Before Situation:

The producer currently manages forested lands with an existing forest management plan. Resource concerns exist which are not addressed by a management plan. A Conservation Evaluation and Monitoring Activity is needed to provide a forest inventory to allow the producer to apply for financial assistance through EQIP or other programs to develop implement needed conservation practices. Associated Practices: 472, 666, 654, 655,384, 394, 383, 379, 338, 381, 391, 791, 490, 612, 660, 311, 380, 314, 315.

After Situation:

After EQIP contract approval, participant has obtained services from a qualified individual for development of the Conservation Evaluation and Monitoring Activities (CEMA) - Forest Inventory. The CEMA criteria requires a forest inventory as a component of a forest management plan to determine current site condition and identify resource concerns. Additional CEMA criteria are detailed in the Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $7,697.69

Scenario Cost/Unit: $7,697.69

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, forester	1302	Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitoring trees for healthy growth, determining optimal thinning schedules, and increasing carbon capture and storage.	Hours	$84.59	91	$7,697.69

Practice: 224 - Aquifer Flow Test

Scenario: #6 - Aquifer Flow Test

Scenario Description:
The typical scenario supports the utilization of an existing or planned vertical turbine or submersible pump in an existing or planned water well for pressurizing an irrigation or stockwater system where water well flow rate is unknown. An aquifer flow test (e.g., step drawdown or constant rate) will be done to determine the flow rate from the well and select a pumping plant to match the pumping requirements of the irrigation or livestock system. Resource Concerns: Water Quality degradation - Excess nutrients in surface and ground waters; Insufficient water for livestock - Inefficient use of irrigation water; inefficient energy use. Associated Practices: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Micro-irrigation; 449 - Irrigation Water Management, 642 - Water Well, 516 - Livestock Pipeline

Before Situation:
Livestock or irrigation system is delivering insufficient water due to unknown volume and flow rate of the aquifer.

After Situation:
With the completion of the aquifer flow test, a known flow rate of the well will determine the correct flow rate and TDH on which a pump can be selected to support an irrigation of stockwater system.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $2,252.79

Scenario Cost/Unit: $2,252.79

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Aquifer Flow Test	1817	High-volume aquifer flow test. Includes labor and equipment.	Hours	$186.02	8	$1,488.16
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 226 - Waste Facility Site Suitability and Feasibility Assessment

Scenario: #5 - Site Evaluation for Planned Storage- Non-dairy Operation

Scenario Description:

Non-Dairy livestock operation. A Qualified Individual will conduct an onsite investigation. Soil data collection, investigation and interpretation of the properties and characteristics, results of tests and samples will be used to determine the appropriateness of the site for the storage facility. Scenario based on one proposed location for the planned storage.

Before Situation:

A waste storage, handling or treatment facility is planned for the operation. The proposed location has not be investigated for determination of suitability and feasibility.

After Situation:

An onsite investigation for soil properties and characteristics was conducted. The proposed location met the criteria to allow the type and size of the planned storage facility. The report documents all data and results.

Feature Measure: One site evaluated

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $4,279.44

Scenario Cost/Unit: $4,279.44

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, small surveying crew	1296	Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. Cost associated with this component includes two man field crew, equipment, vehicle, overhead, and miscellaneous supplies.	Hours	$122.89	10	$1,228.90
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	22	$2,347.84
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$85.82	5	$429.10
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$34.20	8	$273.60

Practice: 226 - Waste Facility Site Suitability and Feasibility Assessment

Scenario: #21 - Site Evaluation for Planned Storage- Dairy Operation

Scenario Description:
Livestock operation is Dairy. A Qualified Individual will conduct an onsite investigation. Soil data collection, investigation and interpretation of the properties and characteristics, results of tests and samples will be used to determine the appropriateness of the site for the storage facility. Scenario based on one proposed location for the planned storage.

Before Situation:
A waste storage, handling or treatment facility is planned for the operation. The proposed location has not be investigated for determination of suitability and feasibility.

After Situation:
An onsite investigation for soil properties and characteristics was conducted. The proposed location met the criteria to allow the type and size of the planned storage facility. The report documents all data and results.

Feature Measure: One site evaluated

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $4,972.96

Scenario Cost/Unit: $4,972.96

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, small surveying crew	1296	Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. Cost associated with this component includes two man field crew, equipment, vehicle, overhead, and miscellaneous supplies.	Hours	$122.89	10	$1,228.90
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	24	$2,561.28
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$85.82	9	$772.38
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$34.20	12	$410.40

Practice: 227 - Evaluation of Existing Waste Storage Facility Components

Scenario: #5 - Evaluation of Existing Components- small operation

Scenario Description:

A Qualified Individual conducts an on-site investigation of up to 2 manure and wastewater handling and storage structures and equipment at the facilities where the livestock are housed. The investigation report will determine whether or not an existing component is in good operating condition. Typical evaluation of 1-2 storage structures, collection, may include pump.

Before Situation:

A waste storage facility and associated equipment is in use on the production area. The existing structure has not been evaluated for good operating condition. New or expanded waste storage and handling facilities could fail is the existing structure is not evaluated.

After Situation:

The Qualified Individual concludes that the existing storage components are in good working order OR has identified the component needs corrective. The CEMA report contains all data and recommendations.

Feature Measure: Per Production Site structures

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $3,902.08

Scenario Cost/Unit: $3,902.08

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	34	$3,628.48
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$34.20	8	$273.60

Practice: 227 - Evaluation of Existing Waste Storage Facility Components

Scenario: #21 - Evaluation of Existing Components-medium operation

Scenario Description:
A Qualified Individual conducts an on-site investigation of all manure and wastewater handling and storage structures and equipment at the facilities where the livestock are housed. The investigation report will determine whether or not an existing component is in good operating condition. Typical livestock production site has 2-5 storage and collection structures and may include pump.

Before Situation:
A waste storage facility and associated equipment is in use on the production area. The existing structure has not been evaluated for good operating condition. New or expanded waste storage and handling facilities could fail is the existing structure is not evaluated.

After Situation:
The Qualified Individual concludes that the existing storage components are in good working order OR has identified the component needs corrective. The CEMA report contains all data and recommendations.

Feature Measure: Per Operation 2-5 Structures

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $4,610.80

Scenario Cost/Unit: $4,610.80

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	40	$4,268.80
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$34.20	10	$342.00

Practice: 227 - Evaluation of Existing Waste Storage Facility Components

Scenario: #37 - Evaluation of Existing Components- large operation

Scenario Description:
A Qualified Individual conducts an on-site investigation of all manure and wastewater handling and storage structures and equipment at the facilities where the livestock are housed. The investigation report will determine whether or not an existing component is in good operating condition. Typical livestock production site has 5 or more storage and collection structures and pump(s).

Before Situation:
A waste storage facility and associated equipment is in use on the production area. The existing structure has not been evaluated for good operating condition. New or expanded waste storage and handling facilities could fail is the existing structure is not evaluated.

After Situation:
The Qualified Individual concludes that the existing storage components are in good working order OR has identified the component needs corrective. The CEMA report contains all data and recommendations.

Feature Measure: Per Operation Structures

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $5,959.84

Scenario Cost/Unit: $5,959.84

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	52	$5,549.44
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$34.20	12	$410.40

Practice: 228 - Agricultural Energy Assessment

Scenario: #5 - Large size, 3 Enterprises

Scenario Description:

An agricultural producer wishes to obtain an energy assessment of their agricultural operation. The operation has 3 enterprises where at least I consists of > 2500 acres of crops, > 1000 animal units, more than 6 irrigation pumps, or > 40,000 sq. ft. of heated greenhouse. An enterprise is defined in the ASABE S612 Performing On-farm Energy Audits Standard. Large operations are described above. The Ag Energy CEMA is an assessment of the energy consuming activities and components of an agricultural operation and includes the requirements of a Type 2 energy audit as described in the ASABE S612 standard. An Ag Energy CEMA includes a baseline assessment of the of systems, equipment, and facilities using a typical year of energy use and recommended measures to prioritize on-farm opportunities to increase energy efficiency and reduce energy use. A Certified TSP will accomplish all work in accordance with the requirements of the CEMA 228 Agricultural Energy Assessment Activity. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

Before Situation:

Producer currently has minimal knowledge of and no plan for energy conservation. The producer currently manages an operation as described above. Producer intends to collaborate with a certified TSP to develop an energy use assessment of their entire operation. The CEMA 228 incorporates recommended measures to maximize energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Energy Efficient Lighting System, 672 Energy Efficient Building Envelope, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

After Situation:

The producer has obtained services from a certified TSP to develop an energy assessment. The CEMA 228 criteria include a baseline assessment using a typical year of energy use, energy savings of recommended improvement measures, and information useful for prioritizing implementation of the measures. The documentation may include recommendations for associated conservation practices which address energy efficiency. The Ag Energy CEMA meets the basic quality criteria for the CEMA 228 activity as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $8,462.20

Scenario Cost/Unit: $8,462.20

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	34	$3,628.48
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$51.35	24	$1,232.40
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$34.20	3	$102.60
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hours	$72.89	48	$3,498.72

Practice: 228 - Agricultural Energy Assessment

Scenario: #21 - Large size, 4+ Enterprises

Scenario Description:

An agricultural producer wishes to obtain an energy assessment of their agricultural operation. The operation has 4 or more enterprises where at least I consists of > 2500 acres of crops, > 1000 animal units, more than 6 irrigation pumps, or > 40,000 sq. ft. of heated greenhouse. An enterprise is defined in the ASABE S612 Performing On-farm Energy Audits Standard. Large operations are described above. The Ag Energy CEMA is an assessment of the energy consuming activities and components of an agricultural operation and includes the requirements of a Type 2 energy audit as described in the ASABE S612 standard. An Ag Energy CEMA includes a baseline assessment of the of systems, equipment, and facilities using a typical year of energy use and recommended measures to prioritize on-farm opportunities to increase energy efficiency and reduce energy use. A Certified TSP will accomplish all work in accordance with the requirements of the CEMA 228 Agricultural Energy Assessment Activity. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

Before Situation:

Producer currently has minimal knowledge of and no plan for energy conservation. The producer currently manages an operation as described above. Producer intends to collaborate with a certified TSP to develop an energy use assessment of their entire operation. The CEMA 228 incorporates recommended measures to maximize energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Energy Efficient Lighting System, 672 Energy Efficient Building Envelope, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

After Situation:

The producer has obtained services from a certified TSP to develop an energy assessment. The CEMA 228 criteria include a baseline assessment using a typical year of energy use, energy savings of recommended improvement measures, and information useful for prioritizing implementation of the measures. The documentation may include recommendations for associated conservation practices which address energy efficiency. The Ag Energy CEMA meets the basic quality criteria for the CEMA 228 activity as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $10,138.68

Scenario Cost/Unit: $10,138.68

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	42	$4,482.24
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$51.35	28	$1,437.80
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$34.20	4	$136.80
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hours	$72.89	56	$4,081.84

Practice: 228 - Agricultural Energy Assessment

Scenario: #37 - Large size, 2 Enterprises

Scenario Description:

An agricultural producer wishes to obtain an energy assessment of their agricultural operation. The operation has 2 enterprises where at least I consists of > 2500 acres of crops, > 1000 animal units, more than 6 irrigation pumps, or > 40,000 sq. ft. of heated greenhouse. An enterprise is defined in the ASABE S612 Performing On-farm Energy Audits Standard. Large operations are described above. The Ag Energy CEMA is an assessment of the energy consuming activities and components of an agricultural operation and includes the requirements of a Type 2 energy audit as described in the ASABE S612 standard. An Ag Energy CEMA includes a baseline assessment of the of systems, equipment, and facilities using a typical year of energy use and recommended measures to prioritize on-farm opportunities to increase energy efficiency and reduce energy use. A Certified TSP will accomplish all work in accordance with the requirements of the CEMA 228 Agricultural Energy Assessment Activity. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

Before Situation:

Producer currently has minimal knowledge of and no plan for energy conservation. The producer currently manages an operation as described above. Producer intends to collaborate with a certified TSP to develop an energy use assessment of their entire operation. The CEMA 228 incorporates recommended measures to maximize energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Energy Efficient Lighting System, 672 Energy Efficient Building Envelope, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

After Situation:

The producer has obtained services from a certified TSP to develop an energy assessment. The CEMA 228 criteria include a baseline assessment using a typical year of energy use, energy savings of recommended improvement measures, and information useful for prioritizing implementation of the measures. The documentation may include recommendations for associated conservation practices which address energy efficiency. The Ag Energy CEMA meets the basic quality criteria for the CEMA 228 activity as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $6,785.72

Scenario Cost/Unit: $6,785.72

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	26	$2,774.72
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$51.35	20	$1,027.00
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$34.20	2	$68.40
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hours	$72.89	40	$2,915.60

Practice: 228 - Agricultural Energy Assessment

Scenario: #53 - Medium size, 4+ Enterprises

Scenario Description:

An agricultural producer wishes to obtain an energy assessment of their agricultural operation. The operation has 4 or more enterprises where at least I consists of 301 to 2500 acres of crops, < 301 to 1000 animal units, 3 - 6 irrigation pumps, or 20,001 to 40,000 sq. ft. of heated greenhouse. An enterprise is defined in the ASABE S612 Performing On-farm Energy Audits Standard. Medium operations are described above. The Ag Energy CEMA is an assessment of the energy consuming activities and components of an agricultural operation and includes the requirements of a Type 2 energy audit as described in the ASABE S612 standard. An Ag Energy CEMA includes a baseline assessment of the of systems, equipment, and facilities using a typical year of energy use and recommended measures to prioritize on-farm opportunities to increase energy efficiency and reduce energy use. A Certified TSP will accomplish all work in accordance with the requirements of the CEMA 228 Agricultural Energy Assessment Activity. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

Before Situation:

Producer currently has minimal knowledge of and no plan for energy conservation. The producer currently manages an operation as described above. Producer intends to collaborate with a certified TSP to develop an energy use assessment of their entire operation. The CEMA 228 incorporates recommended measures to maximize energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Energy Efficient Lighting System, 672 Energy Efficient Building Envelope, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

After Situation:

The producer has obtained services from a certified TSP to develop an energy assessment. The CEMA 228 criteria include a baseline assessment using a typical year of energy use, energy savings of recommended improvement measures, and information useful for prioritizing implementation of the measures. The documentation may include recommendations for associated conservation practices which address energy efficiency. The Ag Energy CEMA meets the basic quality criteria for the CEMA 228 activity as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $8,915.24

Scenario Cost/Unit: $8,915.24

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	36	$3,841.92
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$51.35	28	$1,437.80
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$34.20	4	$136.80
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hours	$72.89	48	$3,498.72

Practice: 228 - Agricultural Energy Assessment

Scenario: #69 - Small size, 4+ Enterprises

Scenario Description:

An agricultural producer wishes to obtain an energy assessment of their agricultural operation. The operation has 4 or more enterprises where 1 is not larger than < 300 acres of crops, < 300 animal units, 1 - 2 irrigation pumps, < 20,000 sq. ft. of heated greenhouse, or maple syrup processing. An enterprise is defined in the ASABE S612 Performing On-farm Energy Audits Standard. Small operations are described above. The Ag Energy CEMA is an assessment of the energy consuming activities and components of an agricultural operation and includes the requirements of a Type 2 energy audit as described in the ASABE S612 standard. An Ag Energy CEMA includes a baseline assessment of the of systems, equipment, and facilities using a typical year of energy use and recommended measures to prioritize on-farm opportunities to increase energy efficiency and reduce energy use. A Certified TSP will accomplish all work in accordance with the requirements of the CEMA 228 Agricultural Energy Assessment Activity. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

Before Situation:

Producer currently has minimal knowledge of and no plan for energy conservation. The producer currently manages an operation as described above. Producer intends to collaborate with a certified TSP to develop an energy use assessment of their entire operation. The CEMA 228 incorporates recommended measures to maximize energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Energy Efficient Lighting System, 672 Energy Efficient Building Envelope, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

After Situation:

The producer has obtained services from a certified TSP to develop an energy assessment. The CEMA 228 criteria include a baseline assessment using a typical year of energy use, energy savings of recommended improvement measures, and information useful for prioritizing implementation of the measures. The documentation may include recommendations for associated conservation practices which address energy efficiency. The Ag Energy CEMA meets the basic quality criteria for the CEMA 228 activity as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $7,905.24

Scenario Cost/Unit: $7,905.24

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	32	$3,415.04
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$51.35	28	$1,437.80
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$34.20	4	$136.80
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hours	$72.89	40	$2,915.60

Practice: 228 - Agricultural Energy Assessment

Scenario: #85 - Medium size, 3 Enterprises

Scenario Description:

An agricultural producer wishes to obtain an energy assessment of their agricultural operation. The operation has 3 enterprises where at least I consists of 301 to 2500 acres of crops, < 301 to 1000 animal units, 3 - 6 irrigation pumps, or 20,001 to 40,000 sq. ft. of heated greenhouse. An enterprise is defined in the ASABE S612 Performing On-farm Energy Audits Standard. Medium operations are described above. The Ag Energy CEMA is an assessment of the energy consuming activities and components of an agricultural operation and includes the requirements of a Type 2 energy audit as described in the ASABE S612 standard. An Ag Energy CEMA includes a baseline assessment of the of systems, equipment, and facilities using a typical year of energy use and recommended measures to prioritize on-farm opportunities to increase energy efficiency and reduce energy use. A Certified TSP will accomplish all work in accordance with the requirements of the CEMA 228 Agricultural Energy Assessment Activity. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

Before Situation:

Producer currently has minimal knowledge of and no plan for energy conservation. The producer currently manages an operation as described above. Producer intends to collaborate with a certified TSP to develop an energy use assessment of their entire operation. The CEMA 228 incorporates recommended measures to maximize energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Energy Efficient Lighting System, 672 Energy Efficient Building Envelope, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

After Situation:

The producer has obtained services from a certified TSP to develop an energy assessment. The CEMA 228 criteria include a baseline assessment using a typical year of energy use, energy savings of recommended improvement measures, and information useful for prioritizing implementation of the measures. The documentation may include recommendations for associated conservation practices which address energy efficiency. The Ag Energy CEMA meets the basic quality criteria for the CEMA 228 activity as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $7,238.76

Scenario Cost/Unit: $7,238.76

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	28	$2,988.16
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$51.35	24	$1,232.40
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$34.20	3	$102.60
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hours	$72.89	40	$2,915.60

Practice: 228 - Agricultural Energy Assessment

Scenario: #101 - Small size, 3 Enterprises

Scenario Description:

An agricultural producer wishes to obtain an energy assessment of their agricultural operation. The operation has 3 enterprises where 1 is not larger than < 300 acres of crops, < 300 animal units, 1 - 2 irrigation pumps, < 20,000 sq. ft. of heated greenhouse, or maple syrup processing. An enterprise is defined in the ASABE S612 Performing On-farm Energy Audits Standard. Small operations are described above. The Ag Energy CEMA is an assessment of the energy consuming activities and components of an agricultural operation and includes the requirements of a Type 2 energy audit as described in the ASABE S612 standard. An Ag Energy CEMA includes a baseline assessment of the of systems, equipment, and facilities using a typical year of energy use and recommended measures to prioritize on-farm opportunities to increase energy efficiency and reduce energy use. A Certified TSP will accomplish all work in accordance with the requirements of the CEMA 228 Agricultural Energy Assessment Activity. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

Before Situation:

Producer currently has minimal knowledge of and no plan for energy conservation. The producer currently manages an operation as described above. Producer intends to collaborate with a certified TSP to develop an energy use assessment of their entire operation. The CEMA 228 incorporates recommended measures to maximize energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Energy Efficient Lighting System, 672 Energy Efficient Building Envelope, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

After Situation:

The producer has obtained services from a certified TSP to develop an energy assessment. The CEMA 228 criteria include a baseline assessment using a typical year of energy use, energy savings of recommended improvement measures, and information useful for prioritizing implementation of the measures. The documentation may include recommendations for associated conservation practices which address energy efficiency. The Ag Energy CEMA meets the basic quality criteria for the CEMA 228 activity as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $6,228.76

Scenario Cost/Unit: $6,228.76

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	24	$2,561.28
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$51.35	24	$1,232.40
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$34.20	3	$102.60
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hours	$72.89	32	$2,332.48

Practice: 228 - Agricultural Energy Assessment

Scenario: #117 - Medium size, 2 Enterprises

Scenario Description:

An agricultural producer wishes to obtain an energy assessment of their agricultural operation. The operation has 2 enterprises where at least I consists of 301 to 2500 acres of crops, < 301 to 1000 animal units, 3 - 6 irrigation pumps, or 20,001 to 40,000 sq. ft. of heated greenhouse. An enterprise is defined in the ASABE S612 Performing On-farm Energy Audits Standard. Medium operations are described above. The Ag Energy CEMA is an assessment of the energy consuming activities and components of an agricultural operation and includes the requirements of a Type 2 energy audit as described in the ASABE S612 standard. An Ag Energy CEMA includes a baseline assessment of the of systems, equipment, and facilities using a typical year of energy use and recommended measures to prioritize on-farm opportunities to increase energy efficiency and reduce energy use. A Certified TSP will accomplish all work in accordance with the requirements of the CEMA 228 Agricultural Energy Assessment Activity. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

Before Situation:

Producer currently has minimal knowledge of and no plan for energy conservation. The producer currently manages an operation as described above. Producer intends to collaborate with a certified TSP to develop an energy use assessment of their entire operation. The CEMA 228 incorporates recommended measures to maximize energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Energy Efficient Lighting System, 672 Energy Efficient Building Envelope, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

After Situation:

The producer has obtained services from a certified TSP to develop an energy assessment. The CEMA 228 criteria include a baseline assessment using a typical year of energy use, energy savings of recommended improvement measures, and information useful for prioritizing implementation of the measures. The documentation may include recommendations for associated conservation practices which address energy efficiency. The Ag Energy CEMA meets the basic quality criteria for the CEMA 228 activity as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $5,562.28

Scenario Cost/Unit: $5,562.28

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	20	$2,134.40
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$51.35	20	$1,027.00
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$34.20	2	$68.40
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hours	$72.89	32	$2,332.48

Practice: 228 - Agricultural Energy Assessment

Scenario: #133 - Small size, 2 Enterprises

Scenario Description:

An agricultural producer wishes to obtain an energy assessment of their agricultural operation. The operation has 2 enterprises where 1 is not larger than < 300 acres of crops, < 300 animal units, 1 - 2 irrigation pumps, < 20,000 sq. ft. of heated greenhouse, or maple syrup processing. An enterprise is defined in the ASABE S612 Performing On-farm Energy Audits Standard. Small operations are described above. The Ag Energy CEMA is an assessment of the energy consuming activities and components of an agricultural operation and includes the requirements of a Type 2 energy audit as described in the ASABE S612 standard. An Ag Energy CEMA includes a baseline assessment of the of systems, equipment, and facilities using a typical year of energy use and recommended measures to prioritize on-farm opportunities to increase energy efficiency and reduce energy use. A Certified TSP will accomplish all work in accordance with the requirements of the CEMA 228 Agricultural Energy Assessment Activity. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

Before Situation:

Producer currently has minimal knowledge of and no plan for energy conservation. The producer currently manages an operation as described above. Producer intends to collaborate with a certified TSP to develop an energy use assessment of their entire operation. The CEMA 228 incorporates recommended measures to maximize energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Energy Efficient Lighting System, 672 Energy Efficient Building Envelope, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

After Situation:

The producer has obtained services from a certified TSP to develop an energy assessment. The CEMA 228 criteria include a baseline assessment using a typical year of energy use, energy savings of recommended improvement measures, and information useful for prioritizing implementation of the measures. The documentation may include recommendations for associated conservation practices which address energy efficiency. The Ag Energy CEMA meets the basic quality criteria for the CEMA 228 activity as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $4,552.28

Scenario Cost/Unit: $4,552.28

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	16	$1,707.52
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$51.35	20	$1,027.00
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$34.20	2	$68.40
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hours	$72.89	24	$1,749.36

Practice: 228 - Agricultural Energy Assessment

Scenario: #149 - Large size, 1 Enterprise

Scenario Description:

An agricultural producer wishes to obtain an energy assessment of their agricultural operation. The operation has either > 2500 acres of crops, > 1000 animal units, more than 6 irrigation pumps, or > 40,000 sq. ft. of heated greenhouse. An enterprise is defined in the ASABE S612 Performing On-farm Energy Audits Standard. A large operation is described above. The Ag Energy CEMA is an assessment of the energy consuming activities and components of an agricultural operation and includes the requirements of a Type 2 energy audit as described in the ASABE S612 standard. An Ag Energy CEMA includes a baseline assessment of the of systems, equipment, and facilities using a typical year of energy use and recommended measures to prioritize on-farm opportunities to increase energy efficiency and reduce energy use. A Certified TSP will accomplish all work in accordance with the requirements of the CEMA 228 Agricultural Energy Assessment Activity. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

Before Situation:

Producer currently has minimal knowledge of and no plan for energy conservation. The producer currently manages an operation as described above. Producer intends to collaborate with a certified TSP to develop an energy use assessment of their entire operation. The CEMA 228 incorporates recommended measures to maximize energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Energy Efficient Lighting System, 672 Energy Efficient Building Envelope, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

After Situation:

The producer has obtained services from a certified TSP to develop an energy assessment. The CEMA 228 criteria include a baseline assessment using a typical year of energy use, energy savings of recommended improvement measures, and information useful for prioritizing implementation of the measures. The documentation may include recommendations for associated conservation practices which address energy efficiency. The Ag Energy CEMA meets the basic quality criteria for the CEMA 228 activity as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $5,109.24

Scenario Cost/Unit: $5,109.24

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	18	$1,920.96
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$51.35	16	$821.60
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$34.20	1	$34.20
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hours	$72.89	32	$2,332.48

Practice: 228 - Agricultural Energy Assessment

Scenario: #165 - Medium size, 1 Enterprise

Scenario Description:

An agricultural producer wishes to obtain an energy assessment of their agricultural operation. The operation has either 301 to 2500 acres of crops, < 301 to 1000 animal units, 3 - 6 irrigation pumps, or 20,001 to 40,000 sq. ft. of heated greenhouse. An enterprise is defined in the ASABE S612 Performing On-farm Energy Audits Standard. A medium operation is described above. The Ag Energy CEMA is an assessment of the energy consuming activities and components of an agricultural operation and includes the requirements of a Type 2 energy audit as described in the ASABE S612 standard. An Ag Energy CEMA includes a baseline assessment of the of systems, equipment, and facilities using a typical year of energy use and recommended measures to prioritize on-farm opportunities to increase energy efficiency and reduce energy use. A Certified TSP will accomplish all work in accordance with the requirements of the CEMA 228 Agricultural Energy Assessment Activity. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

Before Situation:

Producer currently has minimal knowledge of and no plan for energy conservation. The producer currently manages an operation as described above. Producer intends to collaborate with a certified TSP to develop an energy use assessment of their entire operation. The CEMA 228 incorporates recommended measures to maximize energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Energy Efficient Lighting System, 672 Energy Efficient Building Envelope, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

After Situation:

The producer has obtained services from a certified TSP to develop an energy assessment. The CEMA 228 criteria include a baseline assessment using a typical year of energy use, energy savings of recommended improvement measures, and information useful for prioritizing implementation of the measures. The documentation may include recommendations for associated conservation practices which address energy efficiency. The Ag Energy CEMA meets the basic quality criteria for the CEMA 228 activity as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $3,885.80

Scenario Cost/Unit: $3,885.80

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	12	$1,280.64
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$51.35	16	$821.60
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$34.20	1	$34.20
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hours	$72.89	24	$1,749.36

Practice: 228 - Agricultural Energy Assessment

Scenario: #181 - Small size, 1 Enterprise

Scenario Description:

An agricultural producer wishes to obtain an energy assessment of their agricultural operation. The operation has either < 300 acres of crops, < 300 animal units, 1 - 2 irrigation pumps, < 20,000 sq. ft. of heated greenhouse, or maple syrup processing. An enterprise is defined in the ASABE S612 Performing On-farm Energy Audits Standard. A small operation is described above. The Ag Energy CEMA is an assessment of the energy consuming activities and components of an agricultural operation and includes the requirements of a Type 2 energy audit as described in the ASABE S612 standard. An Ag Energy CEMA includes a baseline assessment of the of systems, equipment, and facilities using a typical year of energy use and recommended measures to prioritize on-farm opportunities to increase energy efficiency and reduce energy use. A Certified TSP will accomplish all work in accordance with the requirements of the CEMA 228 Agricultural Energy Assessment Activity. Natural Resource Concern: Energy Efficiency of Equipment and Facilities.

Before Situation:

Producer currently has minimal knowledge of and no plan for energy conservation. The producer currently manages an operation as described above. Producer intends to collaborate with a certified TSP to develop an energy use assessment of their entire operation. The CEMA 228 incorporates recommended measures to maximize energy conservation and efficiency. Associated Practices: 374 Farmstead Energy Improvement, 670 Energy Efficient Lighting System, 672 Energy Efficient Building Envelope, 533 Pumping Plant, or other applicable practices in the NRCS Field Office Technical Guide.

After Situation:

The producer has obtained services from a certified TSP to develop an energy assessment. The CEMA 228 criteria include a baseline assessment using a typical year of energy use, energy savings of recommended improvement measures, and information useful for prioritizing implementation of the measures. The documentation may include recommendations for associated conservation practices which address energy efficiency. The Ag Energy CEMA meets the basic quality criteria for the CEMA 228 activity as cited in the NRCS Field Office Technical Guide.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $2,875.80

Scenario Cost/Unit: $2,875.80

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	8	$853.76
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$51.35	16	$821.60
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hours	$34.20	1	$34.20
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hours	$72.89	16	$1,166.24

Practice: 297 - Feral Swine Damage Assessment

Scenario: #19 - Assessment

Scenario Description:

200 acre tract (all land uses) on which feral swine have negatively impacted water quality (and associated aquatic organisms), soil health and vegetative conditions onsite. Wildlife habitat has been diminished due to feral swine out-competing native species for the same resources (hard and soft mast, tubers, invertebrates), as well as negatively affecting plant regeneration and production. Some species of native wildlife onsite are at risk from predation by feral swine as well as from diseases carried and transmitted either directly or indirectly by feral swine.

Before Situation:

Agricultural producer currently has no plan or knowledge of how resource concerns are caused or exacerbated by the presence of feral swine. Within existing land uses, the producer is interested in management of land to reduce impacts caused by feral swine and improve condition of natural resources.

After Situation:

As a result of feral swine surveillance (coupled with resource and inventory of baseline conditions), the nature and extent of natural resource concerns caused or exacerbated by the presence of feral swine are understood through resource assessments sufficient to inform development of a plan of action to meet quality criteria for all identified resource concerns.

Feature Measure: Managment Site

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $1,113.39

Scenario Cost/Unit: $1,113.39

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	18	$789.66
Materials						
Camera, Monitoring, Stationary	2638	Motion activated, 8 megapixel, weather proof, stationary camera with infrared capability for night operation. Trigger speed of 1 second or less with SD card storage up to 32 GB (not included in the price). Includes materials and shipping only.	Each	$107.91	3	$323.73

Practice: 297 - Feral Swine Damage Assessment

Scenario: #20 - Evaluation

Scenario Description:

200 acre tract (all land uses) on which feral swine have negatively impacted water quality (and associated aquatic organisms), soil health and vegetative conditions onsite. Wildlife habitat has been diminished due to feral swine out-competing native species for the same resources (hard and soft mast, tubers, invertebrates), as well as negatively affecting plant regeneration and production. Some species of native wildlife onsite are at risk from predation by feral swine as well as from diseases carried and transmitted either directly or indirectly by feral swine.

Before Situation:

Agricultural producer is currently or soon will be implementing feral swine component of a conservation plan but the effectiveness of those activities in improving resource conditions is unknown.

After Situation:

Sufficient data and information have been collected to evaluate resource condition relative to baseline conditions and the effectiveness of the feral swine management actions. Necessary adaptive management actions are identified and implemented.(Note: All management activities directly involving feral swine, such as trapping, euthanasia and disposal of carcasses will be the responsibility of the landowner, APHIS, or other partners. NRCS will have no role in these activities.)

Feature Measure: Management Site

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $1,754.80

Scenario Cost/Unit: $1,754.80

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	40	$1,754.80

Practice: 309 - Agrichemical Handling Facility

Scenario: #3 - Fabricated Liquid Storage With Adjacent Concrete Handling Pad

Scenario Description:

This practice scenario is a fabricated agrichemical handling facility for storage of liquid agrichemicals along with an adjacent concrete mixing and loading pad. Due to topography, limited site space and/or geological conditions a fabricated structure is needed. This practice addresses water quality degradation and due to mis-handling, storing, and mixing of agrichemicals where nutrients and/or chemicals are running off into surface waters or leaching into ground water. Associated practices: Heavy Use Area Protection (561), Diversion (362), Access Road (560), Pipeline (516), Nutrient Management (590), Pest Management (595).

Before Situation:

Agrichemicals are improperly stored on the ground or next to a well. Operator mixes the agrichemicals and fills the sprayer tank next to a hydrant. Spills or overflows of agrichemicals contaminate the soil, runoff to surface waters and leaching to ground water.

After Situation:

An agrichemical handling facility is constructed for storage of liquid agrichemicals along with an adjacent handling pad for mixing and loading operations. The average size of the fabricated containment is 30 ft x 40 ft with flexible membrane lined walls. The walls are of modular blocks stacked two high for a 4ft wall height on four sides. A handling pad for mixing and loading is located adjacent to the liquid containment and is 16' x 32' with an application equipment length of 28 ft. The handling pad for mixing and loading operations is sized to contain the length of the agrichemical spray tank and its volume. Install a curbed (6') reinforced concrete handling pad for mixing and loading. The concrete is sealed and sloped to a collection sump. This practice will contain agrichemicals and prevent contamination of surface and ground water resources.

Feature Measure: Liquid Containment Area + Handlin

Scenario Unit: Square Feet

Scenario Typical Size: 1,712.00

Scenario Total Cost: $40,866.75

Scenario Cost/Unit: $23.87

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.11	15	$16.65
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	27	$108.27
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	8	$626.40
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$56.88	8	$455.04
Concrete, CIP, slab on grade, reinforced ACI-350	2759	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. Reinforcing steel ratio equals 0.005 meeting ACI-350	Cubic Yards	$540.51	52	$28,106.52
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	8	$242.88
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	8	$321.04
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	27	$779.22
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	4	$121.44
Synthetic Liner, 40 mil	1387	Synthetic 40 mil HDPE, LLDPE, EPDM, etc membrane liner material. Includes materials and shipping only.	Square Yard	$7.46	243	$1,812.78
Block, pre-cast concrete, modular	1496	Pre-cast concrete blocks, typically 2ft x 2ft x 6ft , includes installation and delivery.	Cubic Yards	$133.22	42	$5,595.24
Painting, porous surface, impermeable	1497	Painting of concrete, foam or other porous surfaces with an impermeable coating. Includes materials and application.	Square Feet	$1.20	512	$614.40
Pump, Sump, less than 1/4 HP	2582	Utility pump, corrosion-resistant, compact and portable, self-priming at 8 ft. or more, 300 GPH at 10 ft., electric, manually operated. Includes materials and shipping (pump and motor).	Each	$173.45	1	$173.45
Mobilization						

Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	2	$364.16
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 309 - Agrichemical Handling Facility

Scenario: #9 - Dry Bulk Fertilizer Storage and handling pad

Scenario Description:

This practice scenario is an agrichemical handling facility for storage or dry fertilizers. This practice addresses water quality degradation and due to mis-handling, storing and mixing of agrichemicals where nutrients and/or chemicals are running off into surface waters or leaching into ground water. Associated practices: Heavy Use Area Protection (561), Diversion (362), Access Road (560), Pipeline (516), Roof Runoff Management (558), Nutrient Management (590), Pest Management (595), Critical Area Planting (342), Roofs and Covers (367)

Before Situation:

Dry Fertilizers are improperly stored. Spills or overflows of fertilizers contaminate the soil, runoff to surface waters and leaching to ground water.

After Situation:

A dry fertilizer storage facility is constructed under a roof with walls on three sides (use Roofs and Covers- 367 for the building structure). The average size of the dry storage facility for storage is 30' x 50'. Install a 6.0ft reinforced concrete wall along three sides of the perimeter of the storage facility. The interior will be divided with two modular block walls (two block high). Adjacent mix load pad is 40ft x 16ft This practice will contain agrichemicals and prevent contamination of surface and ground water resources.

Feature Measure: Outside footprint of dry storage + h

Scenario Unit: Square Feet

Scenario Typical Size: 2,140.00

Scenario Total Cost: $50,132.67

Scenario Cost/Unit: $23.43

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	20.4	$11,568.43
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	72	$288.72
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	8	$626.40
Concrete, CIP, slab on grade, reinforced ACI-350	2759	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. Reinforcing steel ratio equals 0.005 meeting ACI-350	Cubic Yards	$540.51	58	$31,349.58
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	8	$321.04
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	72	$2,077.92
Block, pre-cast concrete, modular	1496	Pre-cast concrete blocks, typically 2ft x 2ft x 6ft , includes installation and delivery.	Cubic Yards	$133.22	17.8	$2,371.32
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 309 - Agrichemical Handling Facility

Scenario: #17 - Concrete storage and handling pad

Scenario Description:

This practice scenario is an agrichemical handling facility for storage and mixing and loading operations. This practice addresses water quality degradation and due to mis-handling, storing and mixing of agrichemicals where nutrients and/or chemicals are running off into surface waters or leaching into ground water. Associated practices: Heavy Use Area Protection (561), Diversion (362), Access Road (560), Pipeline (516), Roof Runoff Management (558), Pumping Plant for Water Control (533), Nutrient Management (590), Pest Management (595), Roofs and Covers (367).

Before Situation:

Agrichemicals are improperly stored on the ground or next to a well. Operator mixes the agrichemicals and fills the sprayer tank next to a hydrant. Spills or overflows of agrichemicals contaminate the soil, runoff to surface waters and leaching to ground water.

After Situation:

An agrichemical storage and handling facility pad is constructed of concrete. The storage and handling pad may be constructed inside an existing building, in a new building using Roofs and Covers (367) for new building structures or outdoors without any type of cover. The average size of the agrichemical handling facility for storage and handling is 35' x 40' with an application equipment length of 36 ft. The handling pad for mixing and loading operations is sized to contain the length of the agrichemical spray tank and its volume. The reinforced concrete meets the requirements of ACI 350. Install a curbed reinforced concrete handling pad for mixing and loading with proper storage of associated dry and/or liquid agrichemicals. The concrete is sealed and sloped to a collection sump. Facility containment is surrounded by square and ramped curbs. Appurtenances to provide fresh water, install doors to buildings, walls for storage of chemicals or demolish old concrete in existing buildings are included. This practice will contain agrichemicals and prevent contamination of surface and ground water resources.

Feature Measure: Total Containment Area

Scenario Unit: Square Feet

Scenario Typical Size: 1,400.00

Scenario Total Cost: $27,476.03

Scenario Cost/Unit: $19.63

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	22	$88.22
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	8	$626.40
Concrete, CIP, slab on grade, reinforced ACI-350	2759	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. Reinforcing steel ratio equals 0.005 meeting ACI-350	Cubic Yards	$540.51	38	$20,539.38
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	16	$459.36
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	8	$321.04
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	22	$634.92
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.29	35.9	$82.21
Painting, porous surface, impermeable	1497	Painting of concrete, foam or other porous surfaces with an impermeable coating. Includes materials and application.	Square Feet	$1.20	1400	$1,680.00
Emergency shower and eye wash station	1499	Emergency shower and ewe wash station unit. Materials only.	Each	$868.23	1	$868.23
Sign, 2' x 1.5'	2257	.125 aluminum, single-sided, with nonreflective, EG reflective or HIP reflective face copy. 2 in. x 8 ft. galvanized perforated square steel tube signpost with 2.5 x 30 inch galvanized anchor and Windbeam Bolt Assembly. Includes materials and shipping only.	Each	$166.44	1	$166.44
Fire Extinguisher, 40-B:C with Mounting Bracket	2555	Dry chemical fire extinguishers (classification 40-B:C) effective against the most common household fires: wood, paper, fabric, flammable liquid fires and live electrical equipment fires. Mounting bracket and strap are included for secure placement of extinguisher. Includes materials only.	Each	$125.04	1	$125.04

Pump, Sump, less than 1/4 HP	2582	Utility pump, corrosion-resistant, compact and portable, self-priming at 8 ft. or more, 300 GPH at 10 ft., electric, manually operated. Includes materials and shipping (pump and motor).	Each	$173.45	1	$173.45
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 311 - Alley Cropping

Scenario: #1 - Single Row

Scenario Description:
The crop or grass land is planted with rows of trees or shrubs to increase crop, grass or forage quality and quantity, increase crop diversity, reduce runoff and erosion, increase soil health, alter subsurface water quantity, increase wildlife and pollinator habitats, reduce movement of nutrients or chemicals and/or increase carbon storage. Final row width, and spacing of trees within the row, is based on farm equipment size, growth form of trees or shrubs, light needs of annual crop or forage and intent of the landowner.

Before Situation:
Farm fields have been in commodity crops, perennial grass or forage production for many years and lack a vertical component such as trees and/or shrubs.

After Situation:
Trees and/or shrubs have been established to adequately address one or more resource concerns to recommended levels.

Feature Measure: planted seedling

Scenario Unit: Acres

Scenario Typical Size: 10.00

Scenario Total Cost: $7,800.83

Scenario Cost/Unit: $780.08

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	4	$101.44
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$75.12	4	$300.48
Mechanical tree planter	1600	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hours	$5.96	4	$23.84
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	20	$574.20
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	4	$121.44
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	4	$194.40
Materials						
Tree, Hardwood, Seedling, Small	1509	Bare root hardwood seedlings 6 to 18 inches tall; includes tropical containerized seedlings of 8 cubic inches or smaller. Includes materials and shipping only.	Each	$0.95	681	$646.95
Tree shelter, solid tube type, 4 in. x 48 in.	1566	4 inch x 48 inch tree tube for protection from animal damage. Materials and shipping only.	Each	$5.29	681	$3,602.49
Cable ties, plastic	1575	Plastic cable ties (typ. 8-12 in.) to assist in securing items. Materials only.	Each	$0.07	681	$47.67
Stakes, wood, 3/4 in. x 3/4 in. x 48 in.	1582	3/4 in. x 3/4 in. x 48 in. wood stakes to fasten items in place. Includes materials only.	Each	$2.09	681	$1,423.29
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 311 - Alley Cropping

Scenario: #2 - Two or more Rows

Scenario Description:
The crop or grass land is planted with rows of trees or shrubs to increase crop, grass or forage quality and quantity, increase crop diversity, reduce runoff and erosion, increase soil health, alter subsurface water quantity, increase wildlife and pollinator habitats, reduce movement of nutrients or chemicals and/or increase carbon storage. Cropland or grassland is planted with trees in 3-row sets with 40 foot alleyways in between. The outside rows of trees are conifers used as nurse trees to train the center row which may be a mast-producing high-value hardwood timber species. Between row spacing is 16 feet and between tree spacing is 20 feet with 40 foot alleys for crops. Final row width, number of rows and spacing of trees within the row is based on farm equipment size, growth form of trees or shrubs, light needs of annual crop or forage and intent of the landowner.

Before Situation:
Farm fields have been in commodity crops, perennial grass or forage production for many years and lack a vertical component such as trees.

After Situation:
Trees and/or shrubs have been established to adequately address one or more resource concerns to recommended levels.

Feature Measure: Area of Treatment

Scenario Unit: Acres

Scenario Typical Size: 10.00

Scenario Total Cost: $6,647.81

Scenario Cost/Unit: $664.78

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	4	$101.44
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$75.12	2.5	$187.80
Mechanical tree planter	1600	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hours	$5.96	2.5	$14.90
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	60	$1,722.60
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	2.5	$75.90
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	12	$583.20
Materials						
Tree, Hardwood, Seedling, Small	1509	Bare root hardwood seedlings 6 to 18 inches tall; includes tropical containerized seedlings of 8 cubic inches or smaller. Includes materials and shipping only.	Each	$0.95	302	$286.90
Tree, Conifer, Seedling, Medium	1514	Containerized conifer seedlings, 8 or 10 cubic inches; or bare root conifer seedlings 1+1 (two-year old seedlings that grew one year in the original seedbed and another year in a transplant bed), or bare root seedlings 2+0 (two-year old seedlings grown in their original seedbed). Includes materials and shipping only.	Each	$1.00	606	$606.00
Tree shelter, solid tube type, 4 in. x 48 in.	1566	4 inch x 48 inch tree tube for protection from animal damage. Materials and shipping only.	Each	$5.29	302	$1,597.58
Bud caps	1574	Poly-mesh or paper material that protect terminal bud from browsing. Materials only.	Each	$0.09	606	$54.54
Cable ties, plastic	1575	Plastic cable ties (typ. 8-12 in.) to assist in securing items. Materials only.	Each	$0.07	302	$21.14
Stakes, wood, 3/4 in. x 3/4 in. x 48 in.	1582	3/4 in. x 3/4 in. x 48 in. wood stakes to fasten items in place. Includes materials only.	Each	$2.09	302	$631.18
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 311 - Alley Cropping

Scenario: #256 - Alley Cropping-single row

Scenario Description:
The crop or grass land is planted with rows of trees to increase crop diversity. Final row width, and spacing of trees within the row, is based on farm equipment size, growth form of trees, light needs of annual crop or grass, and intent of the landowner. The resource concerns are plant condition - inadequate structure and composition.

Before Situation:
The landscape has been cropped or in perennial grass for many years. It is void of any perennial tree vegetation. On cropland site preparation needs may need deep ripping to eliminate any plow pan and on grass land competing vegetation control is accomplished prior to tree planting.

After Situation:
Trees have been established to diversify the crop production of the field. Typically the area planted is 10 acres on approximately 12 x 40 foot spacing.

Feature Measure: planted seedling

Scenario Unit: Each

Scenario Typical Size: 900.00

Scenario Total Cost: $37,070.37

Scenario Cost/Unit: $41.19

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hours	$9.89	80	$791.20
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	4	$101.44
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$75.12	90	$6,760.80
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	180	$5,167.80
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	80	$2,428.80
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	20	$972.00
Materials						
Tree, Hardwood, Potted, Medium	1532	Potted hardwood seedling, 2 gallons or larger. Includes materials and shipping only.	Each	$14.28	910	$12,994.80
Tree shelter, solid tube type, 5 in. x 48 in.	1571	5 inch x 48 inch tree tube for protection from animal damage. Materials and shipping only.	Each	$5.29	910	$4,813.90
Cable ties, plastic	1575	Plastic cable ties (typ. 8-12 in.) to assist in securing items. Materials only.	Each	$0.07	910	$63.70
Stakes, wood, 3/4 in. x 3/4 in. x 60 in.	1583	3/4 in. x 3/4 in. x 60 in. wood stakes to fasten items in place. Includes materials only.	Each	$2.43	910	$2,211.30
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 311 - Alley Cropping

Scenario: #257 - Single row bareroot planting stock

Scenario Description:

The crop or grass land is planted with rows of bareroot trees to increase crop diversity. Final row width, and spacing of trees within the row is based on farm equipment size, growth form of trees, light needs of annual crop or grass, and intent of the landowner. Payment includes the trees, tree planting costs and foregone income for the area of land being removed from crop production and put into trees. The resource concerns are plant condition - inadequate structure and composition. Site preparation is not included and must be implemented through associated practice 490 Tree/Shrub Site Preparation.

Before Situation:

The landscape has been cropped or in perennial grass for many years. It is void of any perennial tree vegetation. On cropland site preparation needs may need deep ripping to eliminate any plow pan and on grass land competing vegetation control is accomplished prior to tree planting.

After Situation:

Trees have been established to diversify the crop production of the field. Typically the area planted is 10 acres on approximately 12 x 40 foot spacing. Associated practices may include: 490 Tree/Shrub Site Preparation, 315 Herbaceous Weed Control, 660 Tree/Shrub Pruning, and 484 Mulching

Feature Measure: Planted seedling

Scenario Unit: Each

Scenario Typical Size: 900.00

Scenario Total Cost: $2,786.34

Scenario Cost/Unit: $3.10

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	1.25	$31.70
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$36.34	1.25	$45.43
Mechanical tree planter	1600	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hours	$5.96	1.25	$7.45
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$415.54	1.25	$519.43
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$342.50	1.25	$428.13
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	1.25	$35.89
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	1.25	$37.95
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	1.25	$60.75
Materials						
Tree, Hardwood, Seedling, Small	1509	Bare root hardwood seedlings 6 to 18 inches tall; includes tropical containerized seedlings of 8 cubic inches or smaller. Includes materials and shipping only.	Each	$0.95	900	$855.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 311 - Alley Cropping

Scenario: #258 - Single row bareroot planting stock with tree shelters

Scenario Description:
The crop or grass land is planted with rows of bareroot trees to increase crop diversity. Final row width, and spacing of trees within the row is based on farm equipment size, growth form of trees, light needs of annual crop or grass, and intent of the landowner. Payment includes the trees, tree planting costs. tree shelters, and foregone income for the area of land being removed from crop production and put into trees. The resource concerns are plant condition - inadequate structure and composition. Site preparation is not included and must be implemented through associated practice 490 Tree/Shrub Site Preparation.

Before Situation:
The landscape has been cropped or in perennial grass for many years. It is void of any perennial tree vegetation. On cropland site preparation needs may need deep ripping to eliminate any plow pan and on grass land competing vegetation control is accomplished prior to tree planting.

After Situation:
Trees have been established to diversify the crop production of the field. Typically the area planted is 10 acres on approximately 12 x 40 foot spacing. Associated practices may include: 490 Tree/Shrub Site Preparation, 315 Herbaceous Weed Control, 660 Tree/Shrub Pruning, 484 Mulching

Feature Measure: planted seedling

Scenario Unit: Each

Scenario Typical Size: 900.00

Scenario Total Cost: $10,235.17

Scenario Cost/Unit: $11.37

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	1.25	$31.70
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$36.34	1.25	$45.43
Mechanical tree planter	1600	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hours	$5.96	1.25	$7.45
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$415.54	1.25	$519.43
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$342.50	1.25	$428.13
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	16.5	$473.72
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	1.25	$37.95
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	1.25	$60.75
Materials						
Tree, Hardwood, Seedling, Small	1509	Bare root hardwood seedlings 6 to 18 inches tall; includes tropical containerized seedlings of 8 cubic inches or smaller. Includes materials and shipping only.	Each	$0.95	900	$855.00
Tree shelter, solid tube type, 5 in. x 48 in.	1571	5 inch x 48 inch tree tube for protection from animal damage. Materials and shipping only.	Each	$5.29	900	$4,761.00
Cable ties, plastic	1575	Plastic cable ties (typ. 8-12 in.) to assist in securing items. Materials only.	Each	$0.07	900	$63.00
Stakes, wood, 3/4 in. x 3/4 in. x 60 in.	1583	3/4 in. x 3/4 in. x 60 in. wood stakes to fasten items in place. Includes materials only.	Each	$2.43	900	$2,187.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 311 - Alley Cropping

Scenario: #275 - Alley Cropping Single Row - Small Acreage

Scenario Description:
The crop or grass land is planted with rows of trees to increase crop diversity. Final row width, and spacing of trees within the row, is based site size, growth form of trees, light needs of annual crop or grass, and intent of the landowner. The resource concerns are plant condition - inadequate structure and composition.

Before Situation:
The landscape has been cropped or in perennial grass for many years. It is void of any perennial tree vegetation. On grassland competing vegetation control is accomplished prior to tree planting.

After Situation:
Trees have been established to diversify crop production of the field. Typically the area planted is less than 5 acres on approximately 12 x 40 foot spacing.

Feature Measure: Planted Seedling

Scenario Unit: Each

Scenario Typical Size: 450.00

Scenario Total Cost: $13,591.22

Scenario Cost/Unit: $30.20

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	2	$50.72
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$12.51	75	$938.25
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	75	$2,153.25
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	10	$486.00
Materials						
Tree, Hardwood, Potted, Medium	1532	Potted hardwood seedling, 2 gallons or larger. Includes materials and shipping only.	Each	$14.28	450	$6,426.00
Tree shelter, solid tube type, 5 in. x 48 in.	1571	5 inch x 48 inch tree tube for protection from animal damage. Materials and shipping only.	Each	$5.29	450	$2,380.50
Cable ties, plastic	1575	Plastic cable ties (typ. 8-12 in.) to assist in securing items. Materials only.	Each	$0.07	900	$63.00
Stakes, wood, 3/4 in. x 3/4 in. x 60 in.	1583	3/4 in. x 3/4 in. x 60 in. wood stakes to fasten items in place. Includes materials only.	Each	$2.43	450	$1,093.50

Practice: 313 - Waste Storage Facility

Scenario: #1 - Earthen Storage Facility, In ground, less than 50K ft3 Storage

Scenario Description:

An earthen waste impoundment constructed to store wastes such as manure, wastewater, and contaminated runoff as part of an agricultural waste management system. This scenario has a design storage volume of less than 50,000 ft3. This practice will address soil and water quality by reducing the pollution potential for surface water and groundwater quality degradation. Earthen storage liners are addressed with another standard. Vehicular and equipment access is addressed in Heavy Use Area Protection (561) to adequately protect liner at agitation and access points. Potential Associated Practices: Pond Sealing or Lining, Soil Treatment (520), Pond Sealing or Lining, Geomembrane or Geosynthetic Clay Liner (521), Pond Sealing or Lining, Concrete (522), Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Roofs and Covers (367), and Waste Separation Facility (632), Waste Treatment (629) .

Before Situation:

Operator presently has a confined animal feeding operation without a waste management system adequate to handle the waste stream leaving the animal production facilities. Manure and other agricultural waste by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or are being transported but not properly utilized or disposed of. This situation poses an environmentally threat of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources.

After Situation:

An earthen storage structure constructed from on-site material provides an environmentally safe facility for storing manure and other agricultural waste by-products. This facility provides the landowner a means of storing waste until it can be utilized in a proper manner in accordance with a nutrient management plan.Typical design size : design storage volume 25,000 ft3; 87'X87' (top); 3:1 inside and outside side slopes; cut/fill ratio = 1.25; total depth = 9.5'

Feature Measure: Design Storage Volume

Scenario Unit: Cubic Feet

Scenario Typical Size: 25,000.00

Scenario Total Cost: $10,341.39

Scenario Cost/Unit: $0.41

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	806	$3,232.06
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.45	578	$1,994.10
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yards	$0.87	224	$194.88
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yards	$3.67	582	$2,135.94
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	4	$114.84
Materials						
Property/Safety Signs	293	Plastic fence safety or property sign, printed on both sides with 6 pre-drilled holes for hanging or nailing. 7.5 x 4.75 inch. Includes materials and shipping only.	Each	$2.09	2	$4.18
Structural steel tubing, 2 in. diameter	1120	Structural steel tubing, 2 inch diameter, 1/8 inch wall thickness, materials only	Feet	$4.35	12.5	$54.38
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	2	$1,846.38

Practice: 313 - Waste Storage Facility

Scenario: #2 - Earthen Storage Facility, Inground, greater than 50K ft3 Storage

Scenario Description:

An earthen waste impoundment constructed to store wastes such as manure, wastewater, and contaminated runoff as part of an agricultural waste management system. This scenario has a design storage volume of more than 50,000 ft3. This practice will address soil and water quality by reducing the pollution potential for surface water and groundwater quality degradation. Earthen storage liners are addressed with another standard. Vehicular and equipment access is addressed in Heavy Use Area Protection (561) to adequately protect liner at agitation and access points.Potential Associated Practices: Pond Sealing or Lining, Compacted Soil Treatment (520), Pond Sealing or Lining, Geomembrane or Geosynthetic (521), Pond Sealing or Lining, Concrete (522), Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Roofs and Covers (367), and Waste Separation Facility (632), Waste Treatment (629).

Before Situation:

Operator presently has a confined animal feeding operation without a waste management system adequate to handle the waste stream leaving the animal production facilities. Manure and other agricultural waste by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or are being transported but not properly utilized or disposed of. This situation poses an environmentally threat of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources.

After Situation:

An earthen storage structure constructed from on-site material provides an environmentally safe facility for storing manure and other agricultural waste by-products. This facility provides the landowner a means of storing waste until it can be utilized in a proper manner in accordance with a nutrient management plan.Typical design size: design storage volume 168,000 ft3; 157'X162' (top); 3:1 inside and outside side slopes; cut/fill ratio = 1.25; total depth = 13' 8'

Feature Measure: Design Storage Volume

Scenario Unit: Cubic Feet

Scenario Typical Size: 168,000.00

Scenario Total Cost: $45,658.98

Scenario Cost/Unit: $0.27

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	4375	$17,543.75
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.45	3284	$11,329.80
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yards	$0.87	741	$644.67
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yards	$3.67	3634	$13,336.78
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	4	$114.84
Materials						
Property/Safety Signs	293	Plastic fence safety or property sign, printed on both sides with 6 pre-drilled holes for hanging or nailing. 7.5 x 4.75 inch. Includes materials and shipping only.	Each	$2.09	2	$4.18
Structural steel tubing, 2 in. diameter	1120	Structural steel tubing, 2 inch diameter, 1/8 inch wall thickness, materials only	Feet	$4.35	17	$73.95
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	2	$1,846.38

Practice: 313 - Waste Storage Facility

Scenario: #3 - Earthen Storage Facility, Above Ground, Embankment

Scenario Description:

An earthen waste impoundment constructed to store wastes such as manure, wastewater, and contaminated runoff as part of an agricultural waste management system. Due to high watertable conditions, shallow to bedrock the earthen embankment is constructed on the soil surface. Earthfill is obtained within five miles off-site. This practice will address soil and water quality by reducing the pollution potential for surface water and groundwater quality degradation. Earthen storage liners are addressed with another standard. Vehicular and equipment access is addressed in Heavy Use Area Protection (561) to adequately protect liner at agitation and access points.Potential Associated Practices: Pond Sealing or Lining, Compacted Soil Treatment (520), Pond Sealing or Lining, Geomembrane or Geosynthetic (521), Pond Sealing or Lining, Concrete (522), Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Roofs and Covers (367), and Waste Separation Facility (632), Waste Treatment (629).

Before Situation:

Operator presently has a confined animal feeding operation without a waste management system adequate to handle the waste stream leaving the animal production facilities. Manure and other agricultural waste by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or are being transported but not properly utilized or disposed of. This situation poses an environmentally threat of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources.

After Situation:

An earthen storage structure constructed from acceptable earthen liner approximately five miles off-site. The soil liner material provides an environmentally safe facility for storing manure and other agricultural waste by-products. This facility provides the landowner a means of storing waste until it can be utilized in a proper manner in accordance with a nutrient management plan.Typical design size: design storage volume 121,200 ft3; 150'X150' (top); 3:1 inside and outside side slopes; embankment topwidth = 10'; compaction ratio = 1.1; total depth = 10'; embankment volume = 4*160*((10+70)/2)*10*1.1

Feature Measure: Design Storage Volume

Scenario Unit: Cubic Feet

Scenario Typical Size: 121,200.00

Scenario Total Cost: $154,577.65

Scenario Cost/Unit: $1.28

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	10430	$41,824.30
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.45	10430	$35,983.50
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hours	$145.01	97	$14,065.97
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yards	$0.87	741	$644.67
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yards	$3.67	9689	$35,558.63
Hauling, bulk, highway truck	1615	Hauling of bulk earthfill, rockfill, waste or debris. One-way travel distance using fully loaded highway dump trucks (typically 16 CY or 20 TN capacity). Includes equipment and labor for truck only. Does not include cost for loading truck.	Cubic Yard Mile	$0.36	48445	$17,440.20
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	4	$114.84
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	97	$3,892.61
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	30	$1,458.00
Materials						
Property/Safety Signs	293	Plastic fence safety or property sign, printed on both sides with 6 pre-drilled holes for hanging or nailing. 7.5 x 4.75 inch. Includes materials and shipping only.	Each	$2.09	2	$4.18
Structural steel tubing, 2 in. diameter	1120	Structural steel tubing, 2 inch diameter, 1/8 inch wall thickness, materials only	Feet	$4.35	13	$56.55
Mobilization						

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	3	$2,769.57

Practice: 313 - Waste Storage Facility

Scenario: #11 - Dry Stack, Concrete floor, and Wood wall or Modular Block Wall

Scenario Description:

This scenario consists of a dry stack facility with concrete Floor with pressure treated wood walls or Modular Block Wall. This scenario is intended for stackable material. This scenario is applicable when geological, soil, climate conditions or state and local regulations prohibit the use of an earthen surface, and requires a hard working surface such as concrete. The purpose of this practice is to temporarily, properly store manure and other agricultural by-products until they can be hauled away from the site for proper disposal or utilization on land at agronomical rates. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Potential Associated practices: 342-Critical Area Planting, 362-Diversion, 561-Heavy Use Area Protection, 367-Roofs and Covers, 558-Roof Runoff Structure, 317-Composting Facility, 633-Waste Recycling, 634-Waste Transfer, 635-Vegetated Treatment Area, 632- Waste Separation

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmentally threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

After Situation:

The typical is 4,000 SqFt (40' x 100') with wood walls. The facility floor is 5' reinforced concrete with 5' pressure treated wood (2' x 8' boards) walls, 6' x 6' x 8' posts set 4' c-c with 6' concrete curbing. Walls allow for greater storage volume. (Wood walls are 4.5' with 0.5' high concrete curbing.) Walls are along three sides of the facility (both short dimensions and one long dimension). Site preparation includes topsoil removal (0.5'), placement of compacted gravel (4'), installing 5' of reinforced concrete floor, setting posts, and installing curbing and wooden walls. Manure and other agricultural by-products are being controlled, by the collection at the source, and stored temporarily, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan.

Feature Measure: Square Foot Floor Area

Scenario Unit: Square Feet

Scenario Typical Size: 4,000.00

Scenario Total Cost: $50,391.57

Scenario Cost/Unit: $12.60

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formless, non reinforced	36	Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$220.05	5.5	$1,210.28
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	62	$31,077.50
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	2	$1,134.16
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	50	$200.50
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$56.88	12	$682.56
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hours	$9.89	12	$118.68
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yards	$3.67	74	$271.58
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	90	$2,583.90
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	12	$364.32
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	30	$1,458.00
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	50	$1,518.00

Dimension Lumber, Treated	1044	Treated dimension lumber with nominal thickness equal or less than 2 inches. Includes lumber and fasteners	Board Feet	$1.79	1620	$2,899.80
Lumber, planks, posts and timbers, treated	1609	Treated dimension lumber with nominal thickness greater than 2 inches. Includes lumber and fasteners. Does not include labor.	Board Feet	$3.53	1104	$3,897.12
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	2	$364.16
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	2	$1,846.38

Practice: 313 - Waste Storage Facility

Scenario: #13 - Dry Stack, Reinforced concrete floor, Reinforced concrete wall

Scenario Description:

This scenario consists of a dry stack facility with reinforced concrete floor and concrete walls. This scenario is applicable when geological, soil, climate conditions or state and local regulations prohibit the use of an earthen surface, and requires a hard working surface such as concrete. This scenario is needed to meet differences in state laws between states for reinforced concrete floor and walls (this is required by WI and MN state regulation) The purpose of this practice is to properly store manure and other agricultural by-products until they can be hauled away from the site for proper disposal or utilization on land at agronomical rates. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Potential Associated practices: 342-Critical Area Planting, 362-Diversion, 561-Heavy Use Area Protection, 367-Roofs and Covers, 558-Roof Runoff Structure, 317-Composting Facility, 633-Waste Recycling, 634-Waste Transfer, 635-Vegetated Treatment Area, 632 Waste Separation Facility

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmentally threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

After Situation:

The typical is 4,000 SqFt (40' x 100' - inside walls); (footprint is 4,192 SqFt (41.5' x 101').. The facility floor is 6' reinforced concrete with 4' reinforced concrete walls. Walls allow for greater storage volume. Manure and other agricultural by-products are being controlled, by the collection at the source, and stored temporarily, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan.

Feature Measure: Stacking Area (inside walls)

Scenario Unit: Square Feet

Scenario Typical Size: 4,000.00

Scenario Total Cost: $74,146.76

Scenario Cost/Unit: $18.54

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	61.6	$30,877.00
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	60	$34,024.80
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	155.2	$622.35
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yards	$3.67	155.2	$569.58
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	30	$1,458.00
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	70	$2,020.20
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$23.32	117	$2,728.44
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	2	$1,846.38

Practice: 313 - Waste Storage Facility

Scenario: #14 - Dry Stack, Nonreinforced concrete floor, Reinforced concrete wall

Scenario Description:

This scenario consists of a dry stack facility with reinforced concrete floor and concrete walls. This scenario is intended for situations where consistency of manure or geographical conditions prohibit earthen floors. This scenario is needed to meet differences in state laws between states for a reinforced concrete wall and plain concrete floor (this is required by MI state regulations). The purpose of this practice is to properly store manure and other agricultural by-products until they can be hauled away from the site for proper disposal or utilization on land at agronomical rates. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Potential

Associated practices: 342-Critical Area Planting, 362-Diversion, 561-Heavy Use Area Protection, 367-Roofs and Covers, 558-Roof Runoff Structure, 317-Composting Facility, 633-Waste Recycling, 634-Waste Transfer, 635-Vegetated Treatment Area

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmentally threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

After Situation:

The typical is 4,000 SqFt (40' x 100' - inside walls). The facility floor is 5' nonreinforced concrete with 4' reinforced concrete walls. Walls allow for greater storage volume. Manure and other agricultural by-products are being controlled, by the collection at the source, and stored temporarily, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan.

Feature Measure: Stacking Area (inside walls)

Scenario Unit: Square Feet

Scenario Typical Size: 4,000.00

Scenario Total Cost: $58,608.04

Scenario Cost/Unit: $14.65

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formless, non reinforced	36	Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$220.05	61.6	$13,555.08
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	60	$34,024.80
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	155.2	$622.35
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yards	$3.67	155.2	$569.58
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	30	$1,458.00
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	16	$1,783.20
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	70	$2,020.20
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$23.32	117	$2,728.44
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	2	$1,846.38

Practice: 313 - Waste Storage Facility

Scenario: #15 - Concrete Storage Tank, Buried, less than 5K ft3

Scenario Description:

This scenario consists of installing a small concrete tank with a design storage volume of less than 5,000 CF that is totally or partially buried and has a solid lid with several openings for direct loading from a heavy use area, gutter cleaner or gravity pipe. Manure is held for 3 to 14 day on smaller operations or transferred to larger storage facility or direct land applied. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Potential Associated Practices: Pond Sealing or Lining, Compacted Soil Treatment (520), Pond Sealing or Lining, Geomembrane or Geosynthetic (521), Pond Sealing or Lining, Concrete (522), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Waste Separation Facility (632), Diversion (362), Subsurface Drain (606), Pumping Plant (533),and Underground Outlet (620).

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmentally threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

After Situation:

Manure and other agricultural by-products are being controlled, by the collection at the source, and stored temporarily, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Tank typically 8' deep x 12' wide x 40' long, with a design storage volume of 3,600 cubic feet plus 6' freeboard and concrete top. Sizing based on manure, other wastes, rainfall, lot runoff, etc. Tanks associated with open lots sized to handle design storm in tank or in combination with lot as per state regulations. Site preparation includes excavation of tank footprint, placement of compacted gravel (5'), pouring concrete floor, walls and top, and backfilling around the tank.

Feature Measure: Design Storage Volume

Scenario Unit: Cubic Feet

Scenario Typical Size: 3,600.00

Scenario Total Cost: $35,232.71

Scenario Cost/Unit: $9.79

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	8	$4,010.00
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	36	$20,414.88
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	213	$1,331.25
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.45	163	$562.35
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	19	$2,479.69
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	4	$114.84
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	19	$762.47
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	30	$1,458.00
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	9	$273.24
Property/Safety Signs	293	Plastic fence safety or property sign, printed on both sides with 6 pre-drilled holes for hanging or nailing. 7.5 x 4.75 inch. Includes materials and shipping only.	Each	$2.09	2	$4.18
Structural steel tubing, 2 in. diameter	1120	Structural steel tubing, 2 inch diameter, 1/8 inch wall thickness, materials only	Feet	$4.35	8	$34.80
Waterstop, PVC, ribbed, 3/16 in x 6 in	1614	Waterstop, PVC, ribbed, 3/16 inch thick by 6 inches wide. Includes materials, equipment and labor.	Feet	$7.58	104	$788.32

Mobilization

Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	3	$546.24
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 313 - Waste Storage Facility

Scenario: #16 - Concrete Storage Tank, Buried, greater than or equal to 5K and less than 15K ft3

Scenario Description:

This scenario consists of installing a concrete tank that has a design storage volume from 5,000 to 14,999 CF that is totally or partially buried and has an open top. The tank can also be under an animal facility with the top cover of either slats or solid concrete lid/floor. Potential Associated Practices: Pond Sealing or Lining, Compacted Soil Treatment (520), Pond Sealing or Lining, Geomembrane or Geosynthetic (521), Pond Sealing or Lining, Concrete (522), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Waste Separation Facility (632), Diversion (362), Subsurface Drain (606), and Underground Outlet (620).

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmentally threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

After Situation:

Manure and other agricultural by-products are being controlled, by the collection at the source, and stored temporarily, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Tank typically 8' deep, with a bottom area of 1256 SF, and a design storage volume of 9,420 cubic feet plus 6' freeboard (40' diameter). Sizing based on manure, other wastes, rainfall, lot runoff, etc. as appropriate. Site preparation includes excavation of tank footprint, placement of compacted gravel (5'), pouring concrete floor and wall, and backfilling around the tank.

Feature Measure: Design Storage Volume

Scenario Unit: Cubic Feet

Scenario Typical Size: 9,420.00

Scenario Total Cost: $37,625.73

Scenario Cost/Unit: $3.99

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	22	$11,027.50
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	26	$14,744.08
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	162	$1,012.50
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.45	323	$1,114.35
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	25	$3,262.75
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	4	$114.84
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	25	$1,003.25
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	30	$1,458.00
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	22	$667.92
Property/Safety Signs	293	Plastic fence safety or property sign, printed on both sides with 6 pre-drilled holes for hanging or nailing. 7.5 x 4.75 inch. Includes materials and shipping only.	Each	$2.09	2	$4.18
Structural steel tubing, 2 in. diameter	1120	Structural steel tubing, 2 inch diameter, 1/8 inch wall thickness, materials only	Feet	$4.35	8	$34.80
Waterstop, PVC, ribbed, 3/16 in x 6 in	1614	Waterstop, PVC, ribbed, 3/16 inch thick by 6 inches wide. Includes materials, equipment and labor.	Feet	$7.58	125	$947.50
Mobilization						

Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	3	$546.24
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 313 - Waste Storage Facility

Scenario: #17 - Concrete Storage Tank, Buried, greater than or equal to 15K and less than 25K ft3

Scenario Description:

This scenario consists of installing a concrete tank that has a design storage volume from 15,000 to 24,999 CF. The tank is totally or partially buried and has an open top. It can be under an animal facility with the top cover being slats or concrete lid/floor. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Potential Associated Practices: Pond Sealing or Lining, Compacted Soil Treatment (520), Pond Sealing or Lining, Geomembrane or Geosynthetic (521), Pond Sealing or Lining, Concrete (522), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Waste Separation Facility (632), Diversion (362), Subsurface Drain (606), Pumping Plant (533) and Underground Outlet (620).

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmentally threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

After Situation:

Manure and other agricultural by-products are being controlled, by the collection at the source, and stored temporarily, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Tank is typically 8 ft deep, with a bottom area of 2,667 sq.ft., and a design storage volume of 20,000 cubic feet plus 6??? freeboard (58.5' diameter). Size based on design volume of manure, other wastes, rainfall, lot runoff, etc as appropriate. Site preparation includes excavation of tank footprint, placement of compacted gravel (5'), pouring concrete floor and wall, and backfilling around the tank.

Feature Measure: Design Storage Volume

Scenario Unit: Cubic Feet

Scenario Typical Size: 20,000.00

Scenario Total Cost: $62,513.48

Scenario Cost/Unit: $3.13

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	45	$22,556.25
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	37	$20,981.96
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	227	$1,418.75
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.45	677	$2,335.65
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	46	$6,003.46
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	4	$114.84
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	46	$1,845.98
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	30	$1,458.00
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	45	$1,366.20
Property/Safety Signs	293	Plastic fence safety or property sign, printed on both sides with 6 pre-drilled holes for hanging or nailing. 7.5 x 4.75 inch. Includes materials and shipping only.	Each	$2.09	2	$4.18
Structural steel tubing, 2 in. diameter	1120	Structural steel tubing, 2 inch diameter, 1/8 inch wall thickness, materials only	Feet	$4.35	8	$34.80
Waterstop, PVC, ribbed, 3/16 in x 6 in	1614	Waterstop, PVC, ribbed, 3/16 inch thick by 6 inches wide. Includes materials, equipment and labor.	Feet	$7.58	184	$1,394.72

Mobilization

Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	3	$546.24
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 313 - Waste Storage Facility

Scenario: #18 - Concrete Storage Tank, Buried, greater than or equal to 25K and less than 50K ft3

Scenario Description:

This scenario consists of installing a concrete tank that has a design storage volume from 25,000 to 49,999 CF. Tank is totally or partially buried and has an open top. Tank can be under a animal facility with the top cover being slats or concrete lid/floor. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Potential Associated Practices: Pond Sealing or Lining, Compacted Soil Treatment (520), Pond Sealing or Lining, Geomembrane or Geosynthetic (521), Pond Sealing or Lining, Concrete (522), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Waste Separation Facility (632), Diversion (362), Subsurface Drain (606), and Underground Outlet (620).

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmentally threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

After Situation:

Manure and other agricultural by-products are being controlled, by the collection at the source, and stored temporarily, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Tank installed is 10' deep, with a bottom area of 2,947 SF, and a design storage volume of 28,000 cubic feet plus 6' freeboard (61.3' diameter). Size based on manure, other wastes, rainfall, lot runoff, etc as appropriate. Site preparation includes excavation of tank footprint, placement of compacted gravel (5'), pouring concrete floor and wall, and backfilling around the tank.

Feature Measure: Design Storage Volume

Scenario Unit: Cubic Feet

Scenario Typical Size: 28,000.00

Scenario Total Cost: $68,891.42

Scenario Cost/Unit: $2.46

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	49	$24,561.25
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	48	$27,219.84
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	334	$2,087.50
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.45	922	$3,180.90
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yards	$3.67	1263	$4,635.21
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	4	$114.84
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	35	$1,701.00
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	49	$1,487.64
Property/Safety Signs	293	Plastic fence safety or property sign, printed on both sides with 6 pre-drilled holes for hanging or nailing. 7.5 x 4.75 inch. Includes materials and shipping only.	Each	$2.09	2	$4.18
Structural steel tubing, 2 in. diameter	1120	Structural steel tubing, 2 inch diameter, 1/8 inch wall thickness, materials only	Feet	$4.35	10	$43.50
Waterstop, PVC, ribbed, 3/16 in x 6 in	1614	Waterstop, PVC, ribbed, 3/16 inch thick by 6 inches wide. Includes materials, equipment and labor.	Feet	$7.58	193	$1,462.94
Mobilization						

Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	3	$546.24
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	2	$1,846.38

Practice: 313 - Waste Storage Facility

Scenario: #19 - Concrete Storage Tank, Buried, greater than or equal to 50K and less than 75K ft3

Scenario Description:

This scenario consists of installing a concrete tank that has a design storage volume from 50,000 to 74,999 CF. Tank is totally or partially buried and has an open top, however it can be under a animal facility with the top cover with slats or concrete lid/floor. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Potential Associated Practices: Pond Sealing or Lining, Compacted Soil Treatment (520), Pond Sealing or Lining, Geomembrane or Geosynthetic (521A), Pond Sealing or Lining, Concrete (522), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Waste Separation Facility (632), Diversion (362), Subsurface Drain (606), and Underground Outlet (620).

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmentally threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

After Situation:

Manure and other agricultural by-products are being controlled, by the collection at the source, and stored temporarily, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Tank typically 12' deep, with a bottom area of 5,391 SF, and a design storage volume of 62,000 cubic feet plus 6' freeboard (82.9' diameter). Sizing based on manure, other wastes, rainfall, lot runoff, etc. as appropriate. Site preparation includes excavation of tank footprint, placement of compacted gravel (5'), pouring concrete floor and wall, and backfilling around the tank.

Feature Measure: Design Storage Volume

Scenario Unit: Cubic Feet

Scenario Typical Size: 62,000.00

Scenario Total Cost: $130,376.30

Scenario Cost/Unit: $2.10

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	88	$44,110.00
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	98	$55,573.84
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	661	$4,131.25
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.45	2078	$7,169.10
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yards	$3.67	2739	$10,052.13
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	4	$114.84
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	40	$1,944.00
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	88	$2,671.68
Property/Safety Signs	293	Plastic fence safety or property sign, printed on both sides with 6 pre-drilled holes for hanging or nailing. 7.5 x 4.75 inch. Includes materials and shipping only.	Each	$2.09	2	$4.18
Structural steel tubing, 2 in. diameter	1120	Structural steel tubing, 2 inch diameter, 1/8 inch wall thickness, materials only	Feet	$4.35	12	$52.20
Waterstop, PVC, ribbed, 3/16 in x 6 in	1614	Waterstop, PVC, ribbed, 3/16 inch thick by 6 inches wide. Includes materials, equipment and labor.	Feet	$7.58	261	$1,978.38
Mobilization						

Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	4	$728.32
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	2	$1,846.38

Practice: 313 - Waste Storage Facility

Scenario: #20 - Concrete Storage Tank, Buried, greater than or equal to 75K and less than 110K ft3

Scenario Description:

This scenario consists of installing a concrete tank that has a design storage volume from 75,000 to 109,999 CF. Tank is totally or partially buried and has an open top. Tank can also be under an animal facility with the top cover using slats or concrete lid/floor. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Potential Associated Practices: Pond Sealing or Lining, Compacted Soil Treatment (520), Pond Sealing or Lining, Geomembrane or Geosynthetic (521), Pond Sealing or Lining, Concrete (522), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Waste Separation Facility (632), Diversion (362), Pipeline (516), Subsurface Drain (606), and Underground Outlet (620).

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmentally threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

After Situation:

Manure and other agricultural by-products are being controlled, by the collection at the source, and stored temporarily, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Tank typically 12' deep, with a bottom area of 8,044 SF, and a design storage capacity of 92,500 cubic feet plus 6' freeboard (101.2' diameter). Sizing based on manure, other wastes, rainfall, lot runoff, etc. as appropriate. Site preparation includes excavation of tank footprint, placement of compacted gravel (5'), pouring concrete floor and wall, and backfilling

Feature Measure: Design Storage Volume

Scenario Unit: Cubic Feet

Scenario Typical Size: 92,500.00

Scenario Total Cost: $173,602.17

Scenario Cost/Unit: $1.88

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	129	$64,661.25
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	119	$67,482.52
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	790	$4,937.50
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.45	3081	$10,629.45
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yards	$3.67	3871	$14,206.57
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	4	$114.84
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	50	$2,430.00
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	129	$3,916.44
Property/Safety Signs	293	Plastic fence safety or property sign, printed on both sides with 6 pre-drilled holes for hanging or nailing. 7.5 x 4.75 inch. Includes materials and shipping only.	Each	$2.09	2	$4.18
Structural steel tubing, 2 in. diameter	1120	Structural steel tubing, 2 inch diameter, 1/8 inch wall thickness, materials only	Feet	$4.35	12	$52.20
Waterstop, PVC, ribbed, 3/16 in x 6 in	1614	Waterstop, PVC, ribbed, 3/16 inch thick by 6 inches wide. Includes materials, equipment and labor.	Feet	$7.58	318	$2,410.44
Mobilization						

Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	5	$910.40
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	2	$1,846.38

Practice: 313 - Waste Storage Facility

Scenario: #21 - Concrete Storage Tank, Buried, greater than equal to 110K ft3

Scenario Description:

This scenario consists of installing a concrete tank that has a design storage volume of 110, 000 or more CF. Tank is totally or partially buried and has an open top. Tank can also be under a animal facility with the top cover using slats or concrete lid/floor. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Potential Associated Practices: Pond Sealing or Lining, Compacted Soil Treatment (520), Pond Sealing or Lining, Geomembrane or Geosynthetic (521), Pond Sealing or Lining, Concrete (522), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Waste Separation Facility (632), Diversion (362), Pipeline (516), Subsurface Drain (606), and Underground Outlet (620).

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmentally threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

After Situation:

Manure and other agricultural by-products are being controlled, by the collection at the source, and stored temporarily, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Tank typically 14' deep with a bottom area of 11,304 SF and a design storage volume of 152,600 CF plus 6' freeboard (120' diameter). Sizing based on manure, other wastes, rainfall, lot runoff, etc. as appropriate. Site preparation includes excavation of tank footprint, placement of compacted gravel (5'), pouring concrete floor and wall, and backfilling around the tank.

Feature Measure: Design Storage Volume

Scenario Unit: Cubic Feet

Scenario Typical Size: 152,600.00

Scenario Total Cost: $265,906.05

Scenario Cost/Unit: $1.74

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	217	$108,771.25
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	164	$93,001.12
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	1304	$8,150.00
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.45	5170	$17,836.50
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yards	$3.67	6474	$23,759.58
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	4	$114.84
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	60	$2,916.00
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	181	$5,495.16
Property/Safety Signs	293	Plastic fence safety or property sign, printed on both sides with 6 pre-drilled holes for hanging or nailing. 7.5 x 4.75 inch. Includes materials and shipping only.	Each	$2.09	2	$4.18
Structural steel tubing, 2 in. diameter	1120	Structural steel tubing, 2 inch diameter, 1/8 inch wall thickness, materials only	Feet	$4.35	14	$60.90
Waterstop, PVC, ribbed, 3/16 in x 6 in	1614	Waterstop, PVC, ribbed, 3/16 inch thick by 6 inches wide. Includes materials, equipment and labor.	Feet	$7.58	377	$2,857.66
Mobilization						

Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	6	$1,092.48
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	2	$1,846.38

Practice: 313 - Waste Storage Facility

Scenario: #26 - Liner removal prepping for relining the structure

Scenario Description:

This practice scenario includes the rehabilitating of an earthen waste impoundment (embankment or excavated type) that is getting re-lined with liner which meets Waste Storage Facility (313). The purpose of the practice is to address resource concerns related to water quality degradation due to excess nutrient and pathogens in ground and/or surface waters and air quality impacts from greenhouse gases, particulate matter and associated precursors, and objectionable odors.Potential Associated Practices: Pond Sealing or Lining - Compacted Soil (520), Pond Sealing or Lining - Geomembrane or Geosynthetic Clay Liner (521), Pond Sealing or Lining - Concrete (522), Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Roofs and Covers (367), and Waste Separation Facility (632), Waste Treatment (629), Subsurface Drain (606), Underground Outlet (620), Pumping Plant (533)

Before Situation:

Operator presently has a confined animal feeding operation with a waste management system that has been evaluated and determined to be inadequate to handle the waste stream leaving the animal production facilities. This rehabilitates the storage structure to meet current seepage criteria due to an evaluation that the liner no longer meets and/or the existing structure has exceeded the expected lifespan of the facility as originally designed. Manure and other agricultural waste by-products are not being utilized or controlled in an environmentally safe manner with the existing storage system. The wastes are either accumulating at the source due to inadequate size and/or storage, or excessive seepage into the groundwater below the storage with a poor liner. This situation poses an environmentally threat of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. An existing waste storage pond is no longer functioning correctly or is not being used for its intended purpose. It poses a safety hazard for humans and livestock and is a threat to environmentally sustainability by the potential for impacts to water and air quality.

After Situation:

This scenario assumes a waste storage pond, with top dimensions of 110 ft x 110 ft, 8 ft total depth with 2:1 side slopes. The total structural storage volume (design storage Volume) equals 71,371 cubic feet; design operating(storage) volume is 56,097 cubic feet. The volume of earthwork (earthfill and excavation) required to remove the contaminated soil is 6' on all surfaces. Structural removal, as necessary, may include the removal and disposal of the non-functioning liner (if applicable), sealing or removal and disposal of waste transfer components and other appurtenances associated with rehabilitation of the facility. The rehabilitation of a liquid waste storage impoundment includes agitating, removing, and spreading liquid/slurry waste material, removing solid/sludge waste remaining in the bottom. All waste material shall be land applied in accordance with Nutrient Management (590). Removal of waste is not part of the payment. If present, the synthetic liner will be removed and properly disposed of. All inflow devices and associated appurtenances will be removed if they are not going to be used in the new manure storage and properly disposed of. Rehabilitation of the waste impoundment will address water quality degradation, air quality impacts and safety hazards by removing and properly utilizing the waste from the impoundment. The site will become a new manure storage facility (313), but no longer pose a resource concern. Contract liner type separately. (520, 521 and 522)

Feature Measure: Design Storage Volume

Scenario Unit: Cubic Feet

Scenario Typical Size: 71,371.00

Scenario Total Cost: $3,586.50

Scenario Cost/Unit: $0.05

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	241	$607.32
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	12	$1,566.12
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	4	$114.84
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	12	$481.56
Materials						
Property/Safety Signs	293	Plastic fence safety or property sign, printed on both sides with 6 pre-drilled holes for hanging or nailing. 7.5 x 4.75 inch. Includes materials and shipping only.	Each	$2.09	2	$4.18
Structural steel tubing, 2 in. diameter	1120	Structural steel tubing, 2 inch diameter, 1/8 inch wall thickness, materials only	Feet	$4.35	11	$47.85
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 313 - Waste Storage Facility

Scenario: #31 - Dry Stack, concrete floor, no wall

Scenario Description:

This scenario consists of a dry stack facility with reinforced concrete floor without side walls. This scenario is applicable when geological, soil, climate conditions or state and local regulations prohibit the use of an earthen surface, and requires a hard working surface such as concrete. The purpose of this practice is to properly store manure and other solid agricultural by-products until they can be hauled away from the site for proper disposal or utilization on land at agronomical rates. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Potential Associated practices: 342-Critical Area Planting, 362-Diversion, 561-Heavy Use Area Protection, 367-Roofs and Covers, 558-Roof Runoff Structure, 317-Composting Facility, 633-Waste Recycling, 634-Waste Transfer, 632-Waste Separation,635-Vegetated Treatment Area

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

After Situation:

Manure and other agricultural by-products are being controlled, by the collection at the source, and stored on a water tight constructed concrete surface where the waste is stacked, staged, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan. The typical size is 4,000 SqFt (40' x 100') located on the farm headquarters where waste is produced. The facility floor is 5' reinforced concrete over 6' of compacted sand and/or gravel with water stops and slip dowel at joints on 50 ft spacing. Concrete is 9 inches thick at the water tight joints without side walls. Site preparation includes topsoil removal (0.5'), placement of compacted gravel (6'), and installing 5' of reinforced concrete. Refer to CPS 560 Access Road where needed.

Feature Measure: Square Foot Floor Area

Scenario Unit: Square Feet

Scenario Typical Size: 4,000.00

Scenario Total Cost: $41,804.11

Scenario Cost/Unit: $10.45

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	64	$32,080.00
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	74	$296.74
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	10	$783.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	16	$459.36
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	10	$401.30
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	74	$2,135.64
Waterstop, PVC, ribbed, 3/16 in x 6 in	1614	Waterstop, PVC, ribbed, 3/16 inch thick by 6 inches wide. Includes materials, equipment and labor.	Feet	$7.58	480	$3,638.40
Concrete joint slip joint	2375	Concrete joint slip dowel, # 6 rebar, 18 inch with a 9 inch plastic sleeve. Materials only.	Each	$4.35	51	$221.85
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	100	$100.00
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 313 - Waste Storage Facility

Scenario: #32 - Above Ground Steel or Concrete, less than 25K ft3 storage

Scenario Description:

An above ground circular glass lined steel or concrete structure constructed to store wastes such as manure, wastewater, and contaminated runoff as part of an agricultural waste management system. This scenario has a design storage volume of less than 25,000 ft3. This practice will address soil and water quality by reducing the pollution potential for surface water and groundwater quality degradation.Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Waste Separation Facility (632), Waste Treatment (629), and Pumping Plant (533).

Before Situation:

Operator presently has a confined animal feeding operation without a waste management system adequate to handle the waste stream leaving the animal production facilities. Manure and other agricultural waste by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or are being transported but not properly utilized or disposed. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources.

After Situation:

An above ground storage structure provides an environmentally safe facility for storing manure and other agricultural waste by-products. This facility provides the landowner a means of storing waste until it can be utilized in a proper manner in accordance with a nutrient management plan.Typical design size : design storage volume 14,000 ft3; based on 31' X 19' glass lined steel tank (based on Slurrystore table).

Feature Measure: Design Storage Volume

Scenario Unit: Cubic Feet

Scenario Typical Size: 14,000.00

Scenario Total Cost: $147,993.34

Scenario Cost/Unit: $10.57

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	28.5	$16,161.78
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	80	$201.60
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	80	$320.80
Rotary Drill Rig	1595	Rotary drill rig including equipment and power unit costs. Labor not included.	Hours	$353.09	8	$2,824.72
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	24	$2,674.80
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	21.5	$652.74
Structural steel tubing, 2 in. diameter	1120	Structural steel tubing, 2 inch diameter, 1/8 inch wall thickness, materials only	Feet	$4.35	20	$87.00
Waste Storage, Glass lined steel structure (<25,000 ft3)	1616	Includes materials, equipment and labor to install 31' (diameter) X19' (height) steel lined structure. Includes materials, equipment and labor.	Cubic Feet	$8.80	14000	$123,200.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 313 - Waste Storage Facility

Scenario: #33 - Above Ground Steel or Concrete, between 25 and100K ft3 storage

Scenario Description:

An above ground circular glass lined steel or concrete structure constructed to store wastes such as manure, wastewater, and contaminated runoff as part of an agricultural waste management system. This scenario has a design storage volume of between 25,000 and 100,000 ft3. This practice will address soil and water quality by reducing the pollution potential for surface water and groundwater quality degradation.Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Waste Separation Facility (632), Waste Treatment (629), and Pumping Plant (533).

Before Situation:

Operator presently has a confined animal feeding operation without a waste management system adequate to handle the waste stream leaving the animal production facilities. Manure and other agricultural waste by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or are being transported but not properly utilized or disposed. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources.

After Situation:

An above ground storage structure provides an environmentally safe facility for storing manure and other agricultural waste by-products. This facility provides the landowner a means of storing waste until it can be utilized in a proper manner in accordance with a nutrient management plan.Typical design size : design storage volume 78,000 ft3; based on 73' X 19' glass lined steel tank (based on Slurrystore table).

Feature Measure: Design Storage Volume

Scenario Unit: Cubic Feet

Scenario Typical Size: 78,000.00

Scenario Total Cost: $348,371.28

Scenario Cost/Unit: $4.47

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	104	$58,976.32
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	250	$630.00
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	250	$1,002.50
Rotary Drill Rig	1595	Rotary drill rig including equipment and power unit costs. Labor not included.	Hours	$353.09	12	$4,237.08
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	36	$4,012.20
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	73	$2,216.28
Structural steel tubing, 2 in. diameter	1120	Structural steel tubing, 2 inch diameter, 1/8 inch wall thickness, materials only	Feet	$4.35	20	$87.00
Waste Storage, glass lined steel structure, 25,000 - 100,000 cubic foot	1620	Includes materials, equipment and labor to install a steel glass lined structure (based on typical 73' diameter X 19' height) . Includes materials, equipment and labor.	Cubic Feet	$3.53	78000	$275,340.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 313 - Waste Storage Facility

Scenario: #34 - Above Ground Steel or Concrete, between 100 and 200K ft3 storage

Scenario Description:

An above ground circular glass lined steel or concrete structure constructed to store wastes such as manure, wastewater, and contaminated runoff as part of an agricultural waste management system. This scenario has a design storage volume of between 100,000 and 200,000 ft3. This practice will address soil and water quality by reducing the pollution potential for surface water and groundwater quality degradation.Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Waste Separation Facility (632), Waste Treatment (629), and Pumping Plant (533).

Before Situation:

Operator presently has a confined animal feeding operation without a waste management system adequate to handle the waste stream leaving the animal production facilities. Manure and other agricultural waste by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or are being transported but not properly utilized or disposed. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources.

After Situation:

An above ground storage structure provides an environmentally safe facility for storing manure and other agricultural waste by-products. This facility provides the landowner a means of storing waste until it can be utilized in a proper manner in accordance with a nutrient management plan.Typical design size : design storage volume 184,800 ft3; based on 112' X 19' glass lined steel tank (based on Slurrystore table).

Feature Measure: Design Storage Volume

Scenario Unit: Cubic Feet

Scenario Typical Size: 184,800.00

Scenario Total Cost: $623,827.27

Scenario Cost/Unit: $3.38

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	211	$119,653.88
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	470	$1,884.70
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yards	$3.67	470	$1,724.90
Rotary Drill Rig	1595	Rotary drill rig including equipment and power unit costs. Labor not included.	Hours	$353.09	16	$5,649.44
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	48	$5,349.60
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	143.5	$4,356.66
Structural steel tubing, 2 in. diameter	1120	Structural steel tubing, 2 inch diameter, 1/8 inch wall thickness, materials only	Feet	$4.35	20	$87.00
Waste Storage, glass lined steel structure, 100,000-200,000 cubic foot	1621	Includes materials, equipment and labor to install a steel glass lined structure (based on typical 112' diameter X 19' height) . Includes materials, equipment and labor.	Cubic Feet	$2.61	184800	$482,328.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	2	$1,846.38

Practice: 313 - Waste Storage Facility

Scenario: #35 - Above Ground Steel or Concrete, greater than 200K ft3 storage

Scenario Description:

An above ground circular glass lined steel or concrete structure constructed to store wastes such as manure, wastewater, and contaminated runoff as part of an agricultural waste management system. This scenario has a design storage volume of greater than 200,000 ft3. This practice will address soil and water quality by reducing the pollution potential for surface water and groundwater quality degradation.Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Waste Separation Facility (632), Waste Treatment (629), and Pumping Plant (533).

Before Situation:

Operator presently has a confined animal feeding operation without a waste management system adequate to handle the waste stream leaving the animal production facilities. Manure and other agricultural waste by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or are being transported but not properly utilized or disposed. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources.

After Situation:

An above ground storage structure provides an environmentally safe facility for storing manure and other agricultural waste by-products. This facility provides the landowner a means of storing waste until it can be utilized in a proper manner in accordance with a nutrient management plan.Typical design size : design storage volume 244,500 ft3; based on 129' X 19' glass lined steel tank (based on the Slurrystore tables).

Feature Measure: Design Storage Volume

Scenario Unit: Cubic Feet

Scenario Typical Size: 244,500.00

Scenario Total Cost: $790,524.97

Scenario Cost/Unit: $3.23

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	270	$153,111.60
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	584	$2,341.84
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yards	$3.67	584	$2,143.28
Rotary Drill Rig	1595	Rotary drill rig including equipment and power unit costs. Labor not included.	Hours	$353.09	20	$7,061.80
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	56	$6,241.20
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	181	$5,495.16
Structural steel tubing, 2 in. diameter	1120	Structural steel tubing, 2 inch diameter, 1/8 inch wall thickness, materials only	Feet	$4.35	20	$87.00
Waste Storage, glass lined steel structure >200,000 cubic foot	1622	Includes materials, equipment and labor to install a steel glass lined structure (based on typical 129' diameter X 19' height) . Includes materials, equipment and labor.	Cubic Feet	$2.50	244500	$611,250.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	2	$1,846.38

Practice: 313 - Waste Storage Facility

Scenario: #38 - Composted Bedded Pack, Concrete Floor, Concrete Wall

Scenario Description:

A composted bedded pack facility is constructed to store wastes such as manure, wastewater, and contaminated runoff as part of an agricultural waste management system. This scenario is intended for situations where consistency of manure or geological conditions prohibit the use of earthen floors. This practice will address soil and water quality by reducing the pollution potential for surface water and groundwater quality degradation.Potential Associated Practices: Fence (382), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Roofs and Covers (367), Roof Runoff Structure (558) and Underground Outlet (620).

Before Situation:

Operator presently has a confined animal feeding operation without a waste management system adequate to handle the waste stream leaving the animal production facilities. Manure and other agricultural waste by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or are being transported but not properly utilized or disposed. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources.

After Situation:

Using a bedded pack provides an environmentally safe facility for storing manure and other agricultural waste by-products. This facility provides the landowner a means of storing waste until it can be utilized in a proper manner in accordance with a nutrient management plan. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water.Typical design: floor area 4,000 ft2, (40' X 100'); 4' concrete wall height, 3' footing depth with a 6' concrete floor; 20' openings on each end of structure. Site preparation includes excavation of bedded pack area and concrete wall trench, gravel placement for concrete floor (4'), pouring concrete floor and wall, and backfilling around the wall.

Feature Measure: Square Foot Floor Area

Scenario Unit: Square Feet

Scenario Typical Size: 4,000.00

Scenario Total Cost: $66,787.76

Scenario Cost/Unit: $16.70

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	74	$37,092.50
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	42	$23,817.36
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	34	$85.68
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	16	$100.00
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yards	$0.87	102	$88.74
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yards	$3.67	74	$271.58
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	40	$1,944.00
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	50	$1,518.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 314 - Brush Management

Scenario: #1 - Mechanical, Hand tools

Scenario Description:

Using hand tools, such as axes, shovels, hoes, nippers, brush pullers, and including chainsaws to remove or cut off woody plants at of below the root collar. Typical area is moderate rolling to gentle sloping, moderately deep to deep soils that have stands of woody and non herbaceous species that are in the early phases of invasions. Typical unit is 20 acres.

Before Situation:

Area is in the very early phases of woody non herbaceous species encroachment that degrades habitat for desired wildlife species. Future degradation of key forage species and ecological site condition promoting noxious and invasive species and increased soil erosion if woody species are allowed to expand.

After Situation:

Woody species are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition continues to progressing in an upward trend, hydrology and plant health and vigor are sustained.

Feature Measure: Acres treated

Scenario Unit: Acres

Scenario Typical Size: 20.00

Scenario Total Cost: $1,640.50

Scenario Cost/Unit: $82.03

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	40	$252.00
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	2	$50.72
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	2	$36.26
Pruning tools, hand tools	1318	Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included.	Hours	$2.31	40	$92.40
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	40	$1,148.40
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	2	$60.72

Practice: 314 - Brush Management

Scenario: #2 - Mechanical, Small Shrubs

Scenario Description:

Removal of small woody vegetation of medium infestations on gentle sloping to moderately deep to deep soils. The practice entails the removal of brush by the use of mechanical cutter, chopper or other light equipment in order to reduce fuel loading and improve ecological site condition. Brush density has exceeded desired levels based on ecological site potential. It has been determined that the brush is at the medium infestation. Typical unit is 20 acres.

Before Situation:

Area consist of excessive stands of shrub species degrading health and vigor of native herbaceous species promoting noxious and invasive species and degrading wildlife habitat.

After Situation:

Woody species are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and improved wildlife habitat.

Feature Measure: Acres planned

Scenario Unit: Acres

Scenario Typical Size: 20.00

Scenario Total Cost: $3,029.07

Scenario Cost/Unit: $151.45

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	3	$76.08
Mechanical cutter, chopper	943	Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included.	Hours	$116.89	17	$1,987.13
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	17	$516.12
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	3	$145.80
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 314 - Brush Management

Scenario: #3 - Mechanical, Large Shrubs

Scenario Description:

Removal of large woody vegetation of medium infestations on gentle sloping to moderately deep to deep soils. The practice entails the removal of brush by pushing, grubbing, masticating, chaining and then raking or piling in order to reduce fuel loading and improve ecological site condition. Brush density has exceeded desired levels based on ecological site potential. It has been determined that the brush is at the medium infestation. Typical unit is 20 acres.

Before Situation:

Area consist of excessive stands of shrub species degrading health and vigor of native herbaceous species promoting noxious and invasive species and degrading wildlife habitat.

After Situation:

Woody species are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and improved wildlife habitat.

Feature Measure: Acres planned

Scenario Unit: Acres

Scenario Typical Size: 20.00

Scenario Total Cost: $8,595.15

Scenario Cost/Unit: $429.76

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 200 HP	928	Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included.	Hours	$182.87	33	$6,034.71
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	3	$76.08
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	3	$91.08
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	33	$1,324.29
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	3	$145.80
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 314 - Brush Management

Scenario: #4 - Mechanical and Chemical, Small Shrubs

Scenario Description:

Removal of small woody vegetation of medium infestations on gentle sloping to moderately deep to deep soils. The practice entails the removal of brush by the use of mechanical cutter, chopper or other light equipment followed by an application of low cost chemicals in low volumes of material in order to reduce fuel loading and improve ecological site condition. Brush density has exceeded desired levels based on ecological site potential. It has been determined that the brush is at the medium infestation rate. Typical unit is 20 acres.

Before Situation:

Area consist of excessive stands of shrub species degrading health and vigor of native herbaceous species promoting noxious and invasive species and degrading wildlife habitat.

After Situation:

Woody species are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and improved wildlife habitat.

Feature Measure: Acres planned

Scenario Unit: Acres

Scenario Typical Size: 20.00

Scenario Total Cost: $3,581.47

Scenario Cost/Unit: $179.07

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	3	$76.08
Mechanical cutter, chopper	943	Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included.	Hours	$116.89	17	$1,987.13
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	20	$134.60
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	17	$516.12
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	3	$145.80
Materials						
Herbicide, Picloram	337	Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$19.28	20	$385.60
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.61	20	$32.20
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 314 - Brush Management

Scenario: #5 - Chemical, Individual Plant Treatment

Scenario Description:
This Practice is for the implementation of brush management on range, pasture or native pasture using Individual Plant Treatment (IPT). The typical method of control is application of herbicides (basal or foliar location) on selected individual plants.

Before Situation:
Brush species exceed desired levels resulting in degraded plant condition, loss of forage production, or degraded wildlife habitat. Densities of brush exceed levels indicated in the ecological site descriptions.

After Situation:
Brush has been treated to a level which results in improved plant condition, forage production, or wildlife habitat. The typical method of control is application of herbicides (basal or foliar location) on selected individual plants.

Feature Measure: Acres treated

Scenario Unit: Acres

Scenario Typical Size: 40.00

Scenario Total Cost: $1,784.82

Scenario Cost/Unit: $44.62

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	1	$25.36
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$81.82	10	$818.20
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	10	$181.30
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	1	$30.36
Materials						
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.61	8	$12.88
Herbicide, Triazine	1321	Broad spectrum herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$66.83	8	$534.64
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08

Practice: 314 - Brush Management

Scenario: #6 - Chemical, Ground Applied

Scenario Description:
Apply brush management on 160 acres of rangeland, grazed forest, or pasture thru the use of broadcast application of material using low cost chemical(s) to reduce or remove undesirable deciduous species (brush) in uplands and other areas not in or directly adjacent to streams, ponds, or wetlands.

Before Situation:
Plant, animal, or wildlife resource concerns associated with uplands and other areas not in or adjacent to stream, ponds, or wetland on grazed range, grazed forest, or pasture which are adversely affected by brush.

After Situation:
A 160 acre unit of pasture, grazed range, or grazed forest where reduction or removal of undesirable deciduous species have been accomplished by broadcast or spot treatment chemical application to address plant, animal, and wildlife resource concerns.

Feature Measure: Acres planned

Scenario Unit: Acres

Scenario Typical Size: 160.00

Scenario Total Cost: $5,392.47

Scenario Cost/Unit: $33.70

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	2	$50.72
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	160	$1,076.80
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	2	$60.72
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	2	$97.20
Materials						
Herbicide, Picloram	337	Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$19.28	160	$3,084.80
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.61	160	$257.60
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 314 - Brush Management

Scenario: #7 - Chemical, Aerial Applied

Scenario Description:
Apply brush management on 160 acres of rangeland, grazed forest, or pasture thru the use of broadcast aerial application of material with low cost chemical(s) to reduce or remove undesirable deciduous species (brush) in uplands and other areas not in or directly adjacent to streams, ponds, or wetlands.

Before Situation:
Plant, animal, or wildlife resource concerns associated with uplands and other areas not in or adjacent to stream, ponds, or wetland on grazed range, grazed forest, or pasture which are adversely affected by brush.

After Situation:
A 160 acre unit of pasture, grazed range, or grazed forest where reduction or removal of undesirable deciduous species have been accomplished by broadcast or spot treatment chemical application to address plant, animal, and wildlife resource concerns.

Feature Measure: Acres planned

Scenario Unit: Acres

Scenario Typical Size: 160.00

Scenario Total Cost: $5,205.12

Scenario Cost/Unit: $32.53

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	1	$25.36
Chemical, aerial application, fixed wing	947	Chemical application performed by fixed wing aircraft. Includes equipment, power unit and labor costs.	Acres	$10.99	160	$1,758.40
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	1	$30.36
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	1	$48.60
Materials						
Herbicide, Picloram	337	Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$19.28	160	$3,084.80
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.61	160	$257.60

Practice: 314 - Brush Management

Scenario: #8 - Split method event series

Scenario Description:
The practice entails the control of woody vegetation by treating it up to three times during the multi-year treatment period in order to improve ecological site condition. The brush can be treated with the same method or by a combination of methods. Woody vegetation needs to be treated at least twice in order to fully control it. Generally, herbicide volumes are reduced as the last treatment will kill resprouting stems or those which survived the first treatment or newly sprouted seedlings. Brush density has exceeded desired levels based on ecological site potential.

Before Situation:
Area has excessive stands of woody species degrading health and vigor of desirable species promoting noxious and invasive species and degrading wildlife habitat.

After Situation:
Woody species are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and improved wildlife habitat.

Feature Measure: acres planned

Scenario Unit: Acres

Scenario Typical Size: 180.00

Scenario Total Cost: $20,614.76

Scenario Cost/Unit: $114.53

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	10	$253.60
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hours	$31.60	120	$3,792.00
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	180	$1,211.40
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$36.34	90	$3,270.60
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	130	$3,946.80
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	10	$486.00
Materials						
Herbicide, Triclopyor	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acres	$34.16	180	$6,148.80
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.61	180	$289.80
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	4	$1,215.76

Practice: 314 - Brush Management

Scenario: #9 - Mechanical and Chemical, Large Shrubs

Scenario Description:

Removal of large woody vegetation of medium infestations on gentle sloping to moderately deep to deep soils. The practice entails the removal of brush by pushing, grubbing, masticating, chaining and then raking or piling followed by an application of appropriate chemicals painted on stems in order to remove invasive species as well as reduce fuel loading and improve ecological site condition. Brush density has exceeded desired levels based on ecological site potential. It has been determined that the brush is at the medium infestation. Typical unit is 20 acres forest/wildlife land with invasive species.

Before Situation:

Area consist of excessive stands of shrub species degrading health and vigor of native herbaceous species promoting noxious and invasive species and degrading wildlife habitat.

After Situation:

Woody species are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and improved wildlife habitat.

Feature Measure: Acres planned

Scenario Unit: Acres

Scenario Typical Size: 20.00

Scenario Total Cost: $9,354.07

Scenario Cost/Unit: $467.70

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 200 HP	928	Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included.	Hours	$182.87	33	$6,034.71
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	3	$76.08
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	20	$134.60
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	33	$1,324.29
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	3	$145.80
Materials						
Herbicide, Triclopyor	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acres	$34.16	20	$683.20
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.61	20	$32.20
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 314 - Brush Management

Scenario: #10 - Hand Cut and Chemical, Small Shrubs, Dense Infestation

Scenario Description:

Removal of small woody vegetation of dense infestations on gentle sloping to moderately deep to deep soils. The practice entails the removal of brush by the use of hand pruning & chainsaw some larger stem followed by an application of appropriate chemicals painted on stems in order to remove invasive species and improve ecological site condition. Brush density has exceeded desired levels based on ecological site potential. It has been determined that the invasive species brush is at the dense infestation rate. Typical unit is 5 acres forest/wildlife land with invasive species.

Before Situation:

Area consist of excessive stands of shrub species degrading health and vigor of native herbaceous species promoting noxious and invasive species and degrading wildlife habitat. Typical dense stand of buckthorn or other invasive species in forest site where equipment cannot be used. site has 10000 stems per acre to be removed.

After Situation:

Woody species are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and improved wildlife habitat.

Feature Measure: Acres planned

Scenario Unit: Acres

Scenario Typical Size: 5.00

Scenario Total Cost: $4,566.97

Scenario Cost/Unit: $913.39

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	4	$25.20
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$81.82	10	$818.20
Pruning tools, hand tools	1318	Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included.	Hours	$2.31	100	$231.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	104	$2,985.84
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	3	$145.80
Materials						
Herbicide, Triclopyor	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acres	$34.16	5	$170.80
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.61	5	$8.05
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08

Practice: 314 - Brush Management

Scenario: #333 - Biological Control Grazing of Brush weed control

Scenario Description:
Management of woody non-herbaceous plant species through the use of livestock that are closely herded to concentrate grazing on targeted shrubs.Typical area is moderate rolling to gentle sloping, moderately deep to deep soils that have dense stands of woody non-herbaceous species that exceed the desirableecological site condition. This scenario is an alternative for organic producers.

Before Situation:
Area consist of dense stands of woody non-herbaceous species that exceed the desirable ecological site condition degrading forage quality, promotingnoxious and invasive species, increasing risk of soil erosion and degrading wildlife habitat.

After Situation:
Woody species are grazed to limit the regrowth of shrubs and achieve a desirable plant community based on species composition, structure, density, andcanopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels.

Feature Measure: Acres of area measured

Scenario Unit: Acres

Scenario Typical Size: 10.00

Scenario Total Cost: $2,049.38

Scenario Cost/Unit: $204.94

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	6	$152.16
Trucking, moving livestock to new paddock	961	Livestock transportation costs to implement a grazing rotation using a gooseneck trailer 6 ft. 8 inch x 24 feet. Includes equipment, power unit and labor costs.	Mile	$3.90	75	$292.50
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	4	$72.52
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	20	$574.20
Materials						
Animals used for biological weed control	1130	Goats, Llamas, Sheep, Cattle - Turn-key operation, includes all supporting costs: fence, water, dog, mobilization, herd labor, other labor, etc. Includes materials, equipment, labor, and mobilization.	Head per day	$9.58	100	$958.00

Practice: 314 - Brush Management

Scenario: #351 - Biological Brush Management Low Density

Scenario Description:

Management of woody plant species through the use of livestock that are closely herded to concentrate grazing on targeted shrubs. Typical areas have dense stands of woody non-herbaceous species that exceed the desirable ecological site condition. Undesirable non-herbaceous vegetation may be present and impairing the desired ecological site condition. Targeted grazing herd is mobilized to site. Typical herd size less than 100 head.

Before Situation:

Area consist of dense stands of woody non-herbaceous species that exceed the desirable ecological site condition degrading forage quality, promoting noxious and invasive species, increasing risk of soil erosion and degrading wildlife habitat.

After Situation:

Woody species are grazed to limit the regrowth of targeted shrubs and achieve a desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, affected hydrology and plant health and vigor is returning to near normal levels. Implementation is consistent with the Brush Management 314 plan and specifications.

Feature Measure: Acres Treated

Scenario Unit: Acres

Scenario Typical Size: 10.00

Scenario Total Cost: $7,709.92

Scenario Cost/Unit: $770.99

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	4	$101.44
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	4	$72.52
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	8	$350.96
Materials						
Animals used for biological weed control	1130	Goats, Llamas, Sheep, Cattle - Turn-key operation, includes all supporting costs: fence, water, dog, mobilization, herd labor, other labor, etc. Includes materials, equipment, labor, and mobilization.	Head per day	$9.58	750	$7,185.00

Practice: 314 - Brush Management

Scenario: #370 - Hand Tools and Chemical, moderate infestation

Scenario Description:
Using a combination of chemical treatment and hand tools, such as axes, shovels, hoes, nippers, brush pullers, and including chainsaws to remove or cut off woody plants at or below the root collar. Typical area is moderate rolling to gentle sloping, moderately deep to deep soils that have stands of woody and non-herbaceous species that are in the early phases of invasions. Typical unit is 10 acres. Associated Practices: Early Successional Habitat Development and Management (647), Restoration of Rare and Declining Habitats (643), Shallow Water Development and Management (646), Upland Wildlife Habitat Management (645), Wetland WildlifeHabitat Management (644)

Before Situation:
Area is in the very early phases of woody non herbaceous species encroachment that degrades habitat for desired wildlife species. Future degradation of key forage species and ecological site condition promoting noxious and invasive species and increased soil erosion if woody species are allowed to expand.

After Situation:
Woody species are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height.

Feature Measure: Acres treated

Scenario Unit: Acres

Scenario Typical Size: 10.00

Scenario Total Cost: $5,990.55

Scenario Cost/Unit: $599.06

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	25	$157.50
Brush Chipper, 6 in. capacity	938	Brush Chipper, 6 inch capacity, typically 35 HP. Includes chipper and power unit. Labor not included.	Hours	$34.98	20	$699.60
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	5	$126.80
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$81.82	25	$2,045.50
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	25	$1,096.75
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	50	$1,435.50
Materials						
Herbicide, Imazapyr	336	Pre and post-emergent, non-selective herbicide for control of undesirable vegetation in non-crop areas. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$42.89	10	$428.90

Practice: 314 - Brush Management

Scenario: #378 - Brush Management for 1 Ac. or less

Scenario Description:
Using hand tools and small power tools to remove or cut off invasive woody plants at or below the root collar. Typically this scenario is for woody and non-herbaceous species that are in early phases of invasion and are degrading herbaceous plant health and vigor for the 1 acre small farm.

Before Situation:
Small farm area is in various phases of woody non-herbaceous species enroachment that degrades the biotic integrity of the site resulting in poor herbaceous plant health and vigor. Continued degradation results in increased invasive woody species and poor hydrological site characteristics.

After Situation:
Woody species are removed to achieve desirable biotic conditions for herbaceous plant health and vigor. Hydrological site characteristics and plant health and vigor are improved, and plant pest pressure from invasive woody species is reduced.

Feature Measure: Acres

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $503.93

Scenario Cost/Unit: $503.93

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	1	$6.30
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hours	$31.60	3	$94.80
Pruning tools, hand tools	1318	Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included.	Hours	$2.31	2	$4.62
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	1	$43.87
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	6	$172.26
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08

Practice: 315 - Herbaceous Weed Treatment

Scenario: #1 - Mechanical, Hand

Scenario Description:
Using hand tools, such as axes, shovels, hoes, nippers, to remove or cut off herbaceous plants at of below the root collar. Typical area is moderate rolling to gentle sloping, moderately deep to deep soils that have herbaceous weed species that are in the early phases of invasions. Typical unit is 20 acres.

Before Situation:
Area is in the very early phases of herbaceous weed encroachment that degrades habitat for desired wildlife species. Future degradation of key forage species and ecological site condition promoting noxious and invasive species and increased soil erosion if woody species are allowed to expand.

After Situation:
Herbaceous weeds are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition continues to progressing in an upward trend, hydrology and plant health and vigor are sustained.

Feature Measure: Acres treated

Scenario Unit: Acres

Scenario Typical Size: 10.00

Scenario Total Cost: $660.93

Scenario Cost/Unit: $66.09

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	1	$25.36
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	5	$90.65
Pruning tools, hand tools	1318	Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included.	Hours	$2.31	16	$36.96
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	16	$459.36
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	1	$48.60

Practice: 315 - Herbaceous Weed Treatment

Scenario: #2 - Mechanical

Scenario Description:
Removal of herbaceous weeds of light infestations on gentle sloping to moderately deep to deep soils. The practice entails the removal of herbaceous weeds by the use of mower, brush hog, disc or other light equipment in order to reduce fuel loading and improve ecological site condition. Weed has exceeded desired levels based on ecological site potential. Typical unit is 40 acres.

Before Situation:
Area consist of excessive stands of herbaceous weeds degrading health and vigor of native herbaceous species promoting noxious and invasive species and degrading wildlife habitat.

After Situation:
Herbaceous weeds are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and improved wildlife habitat.

Feature Measure: Acres treated

Scenario Unit: Acres

Scenario Typical Size: 40.00

Scenario Total Cost: $2,423.65

Scenario Cost/Unit: $60.59

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	2	$50.72
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hours	$31.60	20	$632.00
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$36.34	20	$726.80
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	3	$54.39
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	20	$607.20
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	1	$48.60
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 315 - Herbaceous Weed Treatment

Scenario: #3 - Chemical, Spot

Scenario Description:
Land unit on which weed control would be beneficial in order to set back the plant community succession, improve the ecological condition, and improve forage conditions for domestic livestock or wildlife. The practice entails the eradication of vegetation by use of weed treatment, either initial or retreatment using hand-carried equipment (such as a backpack and hand-sprayer) to apply chemicals, in order to eliminate noxious weeds, promote forage productivity, and improve ecological condition. two person crew

Before Situation:
Area consist of excessive stands of herbaceous weeds degrading health and vigor of native herbaceous species promoting noxious and invasive species and degrading wildlife habitat.

After Situation:
Herbaceous weeds are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and improved wildlife habitat.

Feature Measure: Acres treated

Scenario Unit: Acres

Scenario Typical Size: 20.00

Scenario Total Cost: $841.42

Scenario Cost/Unit: $42.07

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	8	$145.04
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	1	$48.60
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$12.66	8	$101.28
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.61	8	$12.88
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 315 - Herbaceous Weed Treatment

Scenario: #4 - Chemical, Ground

Scenario Description:
Land unit on which weed control would be beneficial in order to set back the plant community succession, improve the ecological condition, and improve forage conditions for domestic livestock or wildlife. The practice entails the eradication of vegetation by use of weed treatment using ground equipment to apply chemicals, in order to eliminate noxious weeds, promote forage productivity, and improve ecological condition.

Before Situation:
Area consist of excessive stands of herbaceous weeds degrading health and vigor of native herbaceous species promoting noxious and invasive species and degrading wildlife habitat.

After Situation:
Herbaceous weeds are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and improved wildlife habitat.

Feature Measure: Acres treated

Scenario Unit: Acres

Scenario Typical Size: 20.00

Scenario Total Cost: $973.03

Scenario Cost/Unit: $48.65

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	2	$50.72
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	20	$134.60
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	7	$200.97
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	1	$48.60
Materials						
Herbicide, 2,4-D	330	Broadleaf herbicide labeled for cropland and pasture. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$10.10	20	$202.00
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.61	20	$32.20
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 315 - Herbaceous Weed Treatment

Scenario: #5 - Chemical, Aerial

Scenario Description:
Land unit on which weed control would be beneficial in order to set back the plant community succession, improve the ecological condition, and improve forage conditions for domestic livestock or wildlife. The practice entails the eradication of vegetation by use of weed treatment using airplane or helicopter to apply chemicals, in order to eliminate noxious weeds, promote forage productivity, and improve ecological condition.

Before Situation:
Area consist of excessive stands of herbaceous weeds degrading health and vigor of native herbaceous species promoting noxious and invasive species and degrading wildlife habitat.

After Situation:
Herbaceous weeds are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and improved wildlife habitat.

Feature Measure: Acres treated

Scenario Unit: Acres

Scenario Typical Size: 20.00

Scenario Total Cost: $700.22

Scenario Cost/Unit: $35.01

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	1	$25.36
Chemical, aerial application, fixed wing	947	Chemical application performed by fixed wing aircraft. Includes equipment, power unit and labor costs.	Acres	$10.99	20	$219.80
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	6	$172.26
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	1	$48.60
Materials						
Herbicide, 2,4-D	330	Broadleaf herbicide labeled for cropland and pasture. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$10.10	20	$202.00
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.61	20	$32.20

Practice: 315 - Herbaceous Weed Treatment

Scenario: #6 - hand and chemical

Scenario Description:
Using hand tools, such as axes, shovels, hoes, nippers, to remove or cut off herbaceous plants at or below the root collar. Herbicide is applied to control re-growth of target weeds. Typical area is moderate rolling to gentle sloping, moderately deep to deep soils that have herbaceous weed species that are in the early phases of invasions. Typical unit is 10 acres.

Before Situation:
Area consist of excessive stands of herbaceous weeds degrading health and vigor of native herbaceous species promoting noxious and invasive species and degrading wildlife habitat.

After Situation:
Herbaceous weeds are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and improved wildlife habitat.

Feature Measure: acres planned

Scenario Unit: Acres

Scenario Typical Size: 10.00

Scenario Total Cost: $1,419.61

Scenario Cost/Unit: $141.96

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	1	$25.36
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$81.82	10	$818.20
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	5	$90.65
Pruning tools, hand tools	1318	Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included.	Hours	$2.31	10	$23.10
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	10	$287.10
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	1	$48.60
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$12.66	10	$126.60

Practice: 315 - Herbaceous Weed Treatment

Scenario: #7 - mechanical and chemical

Scenario Description:
Removal of herbaceous weeds of light infestations on gentle sloping to moderately deep to deep soils. The practice entails the removal of herbaceous weeds by the use of mower, brush hog, disc or other light equipment in order to reduce fuel loading and improve ecological site condition, then applying herbicide to control re-growth of target weeds. Weed has exceeded desired levels based on ecological site potential. Typical unit is 40 acres.

Before Situation:
Area consist of excessive stands of herbaceous weeds degrading health and vigor of native herbaceous species promoting noxious and invasive species and degrading wildlife habitat.

After Situation:
Herbaceous weeds are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and improved wildlife habitat.

Feature Measure: acres planned

Scenario Unit: Acres

Scenario Typical Size: 10.00

Scenario Total Cost: $1,388.06

Scenario Cost/Unit: $138.81

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	1	$25.36
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hours	$31.60	5	$158.00
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	10	$67.30
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	2	$36.26
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	10	$303.60
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	1	$48.60
Materials						
Herbicide, Imazapyr	336	Pre and post-emergent, non-selective herbicide for control of undesirable vegetation in non-crop areas. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$42.89	10	$428.90
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.61	10	$16.10
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 315 - Herbaceous Weed Treatment

Scenario: #8 - split method and event series

Scenario Description:
The practice entails the control of herbaceous vegetation by treating it up to three times during the multi-year treatment period in order to improve ecological site condition. The herbs can be treated with the same method or by a combination of methods. Vegetation needs to be treated at least twice in order to fully control it. Generally,herbicide volumes are reduced as the last treatment will kill resprouting stems or those which survived the first treatment or newly sprouted seedlings. Density has exceeded desired levels based on ecological site potential.

Before Situation:
Area consist of excessive stands of herbaceous weeds degrading health and vigor of native herbaceous species promoting noxious and invasive species and degrading wildlife habitat.

After Situation:
Herbaceous weeds are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and improved wildlife habitat.

Feature Measure: acres planned

Scenario Unit: Acres

Scenario Typical Size: 25.00

Scenario Total Cost: $3,693.10

Scenario Cost/Unit: $147.72

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	2	$50.72
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hours	$31.60	6	$189.60
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	50	$336.50
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$36.34	12	$436.08
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	12	$364.32
Materials						
Herbicide, Triclopyor	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acres	$34.16	50	$1,708.00
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	2	$607.88

Practice: 315 - Herbaceous Weed Treatment

Scenario: #9 - Control of Aquatic Invasives, Hand Pulling

Scenario Description:
Removal of aquatic species infestations in aquatic and wetland environments. The practice entails the hand removal of herbaceous weeds. The purpose of the practice is to improve ecological site condition, in particular to make conditions moe favorable to the re-establishment of Wild Rice. Weeds have exceeded desired levels based on ecological site potential. Typical unit is 1 acre.

Before Situation:
Area consist of excessive stands of aquatic invasive species degrading health and vigor of native herbaceous species promoting noxious and invasive species and degrading wildlife habitat.

After Situation:
Herbaceous weeds are removed to achieve the desirable plant community based on species composition, structure, density, and/or height. Ecological site condition is progressing in an upward trend, hydrology and plant height vigor is returning to near normal levels, and improved wildlife habitat.

Feature Measure: <Unknown>

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $1,982.96

Scenario Cost/Unit: $1,982.96

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	8	$202.88
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	40	$1,148.40
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	8	$242.88
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	8	$388.80

Practice: 315 - Herbaceous Weed Treatment

Scenario: #10 - Control of Aquatic Invasives, Mechanical

Scenario Description:
Removal of aquatic species infestations in aquatic and wetland environments. The practice entails the removal of herbaceous weeds by a boat mounted machine that cuts and removes the material. The purpose of the practice is to improve ecological site condition, in particular to make conditions moe favorable to the re-establishment of Wild Rice. Weeds have exceeded desired levels based on ecological site potential. Typical unit is 1 acre.

Before Situation:
Area consist of excessive stands of aquatic invasive species degrading health and vigor of native herbaceous species promoting noxious and invasive species and degrading wildlife habitat.

After Situation:
Herbaceous weeds are removed to achieve the desirable plant community based on species composition, structure, density, and/or height. Ecological site condition is progressing in an upward trend, hydrology and plant height vigor is returning to near normal levels, and improved wildlife habitat.

Feature Measure: <Unknown>

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $1,836.88

Scenario Cost/Unit: $1,836.88

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	7	$177.52
Mechanical cutter, chopper	943	Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included.	Hours	$116.89	9	$1,052.01
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	9	$394.83
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	7	$212.52

Practice: 315 - Herbaceous Weed Treatment

Scenario: #48 - Biological Control Grazing for herbaceous weed control

Scenario Description:

Management of herbaceous plant species through the use of livestock that are closely herded to concentrate grazing on targeted herbaceous species.Typical area is moderate rolling to gentle sloping, moderately deep to deep soils that have dense stands of herbaceous species that exceed the desirable ecological site condition. This scenario is an alternative for organic producers.

Before Situation:

Area consist of dense stands of herbaceous species that exceed the desirable ecological site condition degrading forage quality, promoting noxious and invasive species, increasing risk of soil erosion and degrading wildlife habitat.

After Situation:

Herbaceous species are grazed to limit the regrowth of plants and achieve a desirable plant community based on species composition, structure, and density. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels.

Feature Measure: Acres to be managed

Scenario Unit: Acres

Scenario Typical Size: 10.00

Scenario Total Cost: $2,049.38

Scenario Cost/Unit: $204.94

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	6	$152.16
Trucking, moving livestock to new paddock	961	Livestock transportation costs to implement a grazing rotation using a gooseneck trailer 6 ft. 8 inch x 24 feet. Includes equipment, power unit and labor costs.	Mile	$3.90	75	$292.50
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	4	$72.52
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	20	$574.20
Materials						
Animals used for biological weed control	1130	Goats, Llamas, Sheep, Cattle - Turn-key operation, includes all supporting costs: fence, water, dog, mobilization, herd labor, other labor, etc. Includes materials, equipment, labor, and mobilization.	Head per day	$9.58	100	$958.00

Practice: 315 - Herbaceous Weed Treatment

Scenario: #58 - Biological Management Low Density

Scenario Description:

Management of herbaceous plant species through the use of livestock that are closely herded to concentrate grazing on targeted plants. Typical areas have light density stands of herbaceous species that exceed the desirable ecological site condition. Undesirable herbaceous vegetation may be present and impairing the desired ecological site condition. Targeted grazing herd is mobilized to site. Typical herd size< 100 head. Goal is for maximum consumption of herbaceous plants.

Before Situation:

Area consist of dense stands of herbaceous species that exceed the desirable ecological site condition degrading forage quality, promoting noxious and invasive species, increasing risk of soil erosion and degrading wildlife habitat.

After Situation:

Herbaceous species are grazed to limit the regrowth of targeted plants and achieve a desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, affected hydrology and plant health and vigor is returning to near normal levels. Implementation is consistent with the Herbaceous Weed Management 315 plan and specifications.

Feature Measure: Acres Treated

Scenario Unit: Acres

Scenario Typical Size: 10.00

Scenario Total Cost: $5,314.92

Scenario Cost/Unit: $531.49

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	4	$101.44
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	4	$72.52
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	8	$350.96
Materials						
Animals used for biological weed control	1130	Goats, Llamas, Sheep, Cattle - Turn-key operation, includes all supporting costs: fence, water, dog, mobilization, herd labor, other labor, etc. Includes materials, equipment, labor, and mobilization.	Head per day	$9.58	500	$4,790.00

Practice: 315 - Herbaceous Weed Treatment

Scenario: #89 - Herbaceous Weed Treatment for One Acre or less (not to exceed 1 acre)

Scenario Description:
Using hand and small power tools to remove or cut off herbaceous invasive plants at or below the root collar. Typically this scenario is for herbaceous invasive species that are degrading the 1 acre small farm.

Before Situation:
Small farm area is in various phases of herbaceous species enroachment that degrades the biotic integrity resulting in poor plant health and vigor, and/or wildlife habitat. Continued degradation results in increased plant pest pressure, loss of plant diversity and biotic integrity, and poor hydrological characteristics.

After Situation:
Herbaceous species are removed to achieve desirable biotic conditions and improved plant health and vigor, and/or wildlife habitat. Hydrological site characteristics are improved, and plant pest pressure from invasive herbaceous species are reduced.

Feature Measure: acres

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $348.30

Scenario Cost/Unit: $348.30

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hours	$31.60	1	$31.60
Pruning tools, hand tools	1318	Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included.	Hours	$2.31	2	$4.62
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	1	$43.87
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	3	$86.13
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08

Practice: 316 - Animal Mortality Facility

Scenario: #2 - Incineration Chamber

Scenario Description:

This scenario consists of installing a manufactured Type IV incinerator designed to handle 350 to 850 lbs of average daily mortality for the species and size of the operation. Typically very large poultry or medium sized swine operations. System shall use high temperature (>1,300 degrees F) incineration with a secondary combustion or afterburner chamber prior to flue discharge. After determining average daily mortality in lbs, select smallest incinerator that meets capacity. Payment made per unit of actual chamber size obtained from manufacturers' product literature. This option is not typically least-cost. In most states a roofed static pile with concrete floor and bins would be considered least cost. Therefore consider reducing payment rate as per State Conservationist discretion. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors are reduced, however, in non-attainment areas, certain states may require a higher level of processing such as gasification or other approved methods. Potential Associated Practices: Heavy Use Area Protection (561), Fence (382), Critical Area Planting (342), Access Road (560), Waste Storage Facility (313), Nutrient Management (590), Roofs and Covers (367), Critical Area Planting (342), MI-interim Fueling Facility, Above Ground Storage (713)

Before Situation:

Animal mortality is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, incineration, or interaction with predators. No plan was formulated for both normal and catastrophic mortality events.

After Situation:

Animal mortality is being done in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, complete incineration, and protection from predators to minimize pathogen survival or spreading. In non-attainment areas, certain states may require a higher level of processing such as gasification or different methods. An overall plan covers normal and catastrophic mortality events. Selected method for carcass treatment and disposal meet or are permitted by federal, state, and local laws, rules, regulation. Incinerator installed to handle 700 lbs per day average mortality for a medium poultry or swine operation. Included is a concrete slab to set the incinerator on and a diesel fuel tank installation according to state laws that apply. Ash materials to be stored in suitable containers until land disposal as per the nutrient managment plan or landfilled.

Feature Measure: Incinerator Chamber Volume

Scenario Unit: Cubic Feet

Scenario Typical Size: 55.80

Scenario Total Cost: $17,611.02

Scenario Cost/Unit: $315.61

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	4	$2,005.00
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	8	$20.16
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	4	$25.00
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	1	$130.51
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	1	$28.71
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	1	$30.36
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	4	$121.44
Fuel Tank, Anchored	1033	Fuel tank for operating incinerators and/or gasifiers. Materials only.	Gallons	$5.50	285	$1,567.50
Incinerator, 400 lbs/day	1625	Poultry and livestock incinerator with an approximate chamber capacity of 400 pounds per day. Includes equipment and after burner only.	Each	$11,971.00	1	$11,971.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 316 - Animal Mortality Facility

Scenario: #4 - Animal Mortality Composting Facility

Scenario Description:

This scenario consists of installing one of the following systems to facilitate the composting of poultry and swine mortalities:- Static Pile, Bin. Two or more wood or concrete bins, open on one end on a concrete pad with a concrete apron operated as a static pile(s) that have sufficient carbon material to allow composting and allow natural aeration. Piles are turned to go through a second heat cycle prior to final land application. - A commercially manufactured grinding batch composter with a minimum capacity of 1,000 lbs per batchPayment shall be based on the Total Bin Area of a Static Pile, Bin system.Consult Roofs and Covers (367) if a roof is required over the facility. Size of facility based on daily mortality and sizing procedures accepted in particular state. Potential Associated Practices: Roofs and Cover (367), Critical Area Planting (342), Nutrient Management (590), Access Road (560),) Heavy Use Area Protection (561), Structure for Water Control (587), Roof Runoff Structure (558), Diversion (362), Subsurface Drain (606), and Underground Outlet (620).

Before Situation:

Animal mortality is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, incineration, or interaction with predators. No plan was formulated for both normal and catastrophic mortality events.

After Situation:

Animal mortality is being done in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, complete composting, and protection from predators to minimize pathogen survival or spreading. An overall plan covers normal and catastrophic mortality events. Selected method for carcass treatment and disposal meet or are permitted by federal, state, and local laws, rules, regulation. Install a 15' deep by 54' long pad with five bins (each 10' x 14') with 6' high walls and one end open. Open side to have concrete apron due to heavy traffic during loading and movement from bin to bin. The apron IS TO BE contracted under 561 Heavy Use Area Protection. Site preparation includes topsoil removal, installing 6' of gravel sub-base, installing concrete slab and apron, installing 6' high concrete walls. Piles are turned by moving to adjacent bin to go through a second heat cycle prior to final land application.Roofs are addressed under Roofs and Covers (367). The apron IS TO BE contracted under 561 Heavy Use Area Protection.

Feature Measure: Total Bin Area

Scenario Unit: Square Feet

Scenario Typical Size: 700.00

Scenario Total Cost: $36,420.95

Scenario Cost/Unit: $52.03

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	62.2	$35,272.38
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	45	$113.40
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	15	$93.75
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	15	$455.40
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 316 - Animal Mortality Facility

Scenario: #5 - Mortality Composting Facility, Overlapping piles

Scenario Description:

This scenario consists of installing a Static Pile, overlapping pile system to facilitate the composting of large animal mortalities such as bovine and horses.- Overlapping pile system consists of two cells next to each other with a divider wall in the middle, The mortality composting is operated as aerated pile(s) that have sufficient carbon material to allow composting. The piles are to be turned for aeration. Piles are turned to go through a second heat cycle prior to final land application. Payment shall be based on the Total composting area.Consult Roofs and Covers (367) if a roof is required over the facility. Size of facility based on daily mortality and sizing procedures accepted in particular state. Potential Associated Practices: Roofs and Cover (367), Heavy Use Area Protection (561), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Structure for Water Control (587), Roof Runoff Structure (558), Diversion (362), Subsurface Drain (606), and Underground Outlet (620).

Before Situation:

Animal mortality is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, incineration, or interaction with predators. No plan was formulated for both normal and catastrophic mortality events.

After Situation:

Animal mortality is being done in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, complete composting, and protection from predators to minimize pathogen survival or spreading. An overall plan covers normal and catastrophic mortality events. Selected method for carcass treatment and disposal meet or are permitted by federal, state, and local laws, rules, regulation. Install a 40 ft x 75ft structure with a 4 ft reinforced concrete on both end with a 2 ft curb down the center of the facility between the two overlapping piles. Open side to have an apron due to heavy traffic during loading and movement from pile to pile that is to be contracted under 561 Heavy Use Area Protection. Site preparation includes topsoil removal, sub-base, installing 6' concrete slab and reinforced concrete wall. Piles are turned by moving the pile over the 2 ft curb to go through a second heat cycle prior to final land application.Roofs are addressed under Roofs and Covers (367) and loading and unloading apron addressed under Heavy Use Area Protection (561)

Feature Measure: Total Composting Area

Scenario Unit: Square Feet

Scenario Typical Size: 3,000.00

Scenario Total Cost: $32,358.88

Scenario Cost/Unit: $10.79

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formless, non reinforced	36	Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$220.05	56	$12,322.80
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	28	$15,878.24
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	40	$250.00
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	11	$861.30
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	11	$441.43
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	40	$1,154.40
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Aggregate, Shipping, Cubic Yard-mile	2360	Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul).	Cubic Yard Mile	$0.42	1200	$504.00

Practice: 316 - Animal Mortality Facility

Scenario: #41 - In vessel Rotary Drum

Scenario Description:

An in vessel rotary drum system is installed to compost livestock mortality. A secondary composting storage area is required to finish the composting process prior to land application. A rotary drum system is necessary in situation such as but not limited to; where the producer has a limited footprint, state or local law prohibits the use of static pile composting, or in areas where complete pathogen destruction is needed during the composting process. Consult Roofs and Covers (367) if a roof is required over the facility. Size of facility based on daily mortality and sizing procedures accepted in particular state. Potential Associated Practices: Roofs and Cover (367), Heavy Use Area Protection (561), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Roof Runoff Structure (558), Diversion (362), Subsurface Drain (606), and Underground Outlet (620).

Before Situation:

Animal mortality is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, incineration, or interaction with predators. No plan was formulated for both normal and catastrophic mortality events.

After Situation:

Animal mortality is being done in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, complete composting, and protection from predators to minimize pathogen survival or spreading. An overall plan covers normal and catastrophic mortality events. Selected method for carcass treatment and disposal meet or are permitted by federal, state, and local laws, rules, regulation. The typical system handles between 250 - 600 lbs/day of mortality, plus addition of carbon material. A 5 ft diameter, 22 ft long rotary drum is installed on a concrete pad that can process 325 lbs of mortality per day. This scenario includes removal of topsoil, compacted 4' sub-base and concrete slab under the rotary drum and secondary composting pad with modular blocks as walls on 3 sides to contain the composted material. Typical is a three sided 20ft x 20 ft bin x 4 ft walls, on a 20ft wide x 60ft long concrete pad with the rotary drum. This rotary drum scenario is used in situations such as, but not limited to, where the producer has a limited footprint, where state or local law prohibits the use of static pile composting, or in areas where complete pathogen destruction is needed during the composting process. Roofs are addressed under Roofs and Covers (367) and loading and unloading apron is addressed under Heavy Use Area Protection (561)

Feature Measure: Capacity Volume of Drum

Scenario Unit: Cubic Feet

Scenario Typical Size: 366.00

Scenario Total Cost: $74,555.27

Scenario Cost/Unit: $203.70

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	18.5	$9,273.13
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	15	$93.75
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	3	$234.90
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	24	$1,052.88
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	3	$120.39
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	15	$432.90
Block, pre-cast concrete, modular	1496	Pre-cast concrete blocks, typically 2ft x 2ft x 6ft , includes installation and delivery.	Cubic Yards	$133.22	19.6	$2,611.11
Composter, drum, 12 CY	1627	12 CY drum composter unit. Total capacity range is 10-19 CY. Includes equipment, operation controls, and shipping. Labor not included.	Each	$59,789.50	1	$59,789.50
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 316 - Animal Mortality Facility

Scenario: #42 - Incineration greater than 100 CF Chamber

Scenario Description:

This scenario consists of installing a manufactured Type IV incinerator designed to handle a single 1,200 to 1,500 lbs. mortality. Typically a single dairy cow or multiple heifers or swine. System shall use high temperature (>1,300 degrees F) incineration with a secondary combustion or afterburner chamber prior to flue discharge. Select smallest incinerator that has a bin capacity to handle largest individual mortality. Payment made per unit of actual chamber size obtained from manufacturers' product literature. This option uses a very small footprint, however, it costs 15-20 gallons of diesel fuel per fill. The usage needs to be significant. At 500 cows with replacements, this option would offset a 4,000 SF concrete pad with another 8,000 to 12,000 SF of grassed area. This option for small dairy operations would not typically be least-cost. In most states either a roofed or unroofed static pile with concrete floor and walls would be considered least cost. Unless regulations require this or severe site limitations exist, consider reducing payment rate as per State Conservationist discretion. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed, however, in non-attainment areas, certain states may require a higher level of processing such as gasification or other approved methods. Potential Associated Practices: Heavy Use Area Protection (561), Fence (382), Critical Area Planting (342), Access Road (560), Waste Storage Facility (313), Nutrient Management (590), Roofs and Covers (367), Critical Area Planting (342).

Before Situation:

Animal mortality is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, incineration, or interaction with predators. No plan was formulated for both normal and catastrophic mortality events.

After Situation:

Animal mortality is being done in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, complete incineration, and protection from predators to minimize pathogen survival or spreading. An overall plan covers normal and catastrophic mortality events. In non-attainment areas, certain states may require a higher level of processing such as gasification or other approved method. Selected method for carcass treatment and disposal meet or are permitted by federal, state, and local laws, rules, regulations. Typical incinerator installed to handle a whole 1350 lb dairy cow on a 1,000 cow operation and has an incinerator chamber volume of 119.6 cubic feet. Included is a concrete slab to set the incinerator on and a fuel tank. Ash materials to be stored in suitable containers until land disposal as per the nutrient management plan or landfilled. Proper incineration will require between 15 and 25 gallons of diesel fuel per usage.

Feature Measure: Incineration Chamber Volume

Scenario Unit: Cubic Feet

Scenario Typical Size: 119.60

Scenario Total Cost: $18,477.56

Scenario Cost/Unit: $154.49

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	4	$2,005.00
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	8	$20.16
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	1	$130.51
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	1	$28.71
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	1	$30.36
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	4	$121.44
Fuel Tank, Anchored	1033	Fuel tank for operating incinerators and/or gasifiers. Materials only.	Gallons	$5.50	285	$1,567.50
Incinerator, 600 lbs/day	1626	Poultry and livestock incinerator with an approximate chamber capacity of 600 pounds per day. Includes equipment and after burner only.	Each	$13,809.25	1	$13,809.25
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 316 - Animal Mortality Facility

Scenario: #56 - Forced Air Composting with mortality preprocessing ??? poultry/turkey Unit

Scenario Description:

This scenario consists of installing a manufactured Forced Air Composting with mortality preprocessing ??? poultry/turkey Unit designed to handle up to 1200 lbs of average daily poultry/turkey mortality. The unit consist of a concrete slab with cut in forced aeration tubes, a mortality shredding/grinding machine, area for storage of 2nd stage compost and composting material, interior concrete wall to aid in handling the compost, and a roof over the entire system. The unit will be certified by a PE to meet state requirements. After determining average daily mortality in lbs, select the size unit needed from manufacturer supplied sizing table to determine square footage of facility needed. Payment made per unit square footage size obtained from manufacturers' product literature. This option is considered advanced mortality treatment and will require a smaller building footprint (75-50% less) than a roofed static compost pile with concrete floor and bins. Forced aeration compost facilities will also typically have reduced odor and process mortality in less time that static bin composting. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Heavy Use Area Protection (561), Fence (382), Critical Area Planting (342), Access Road (560), Waste Storage Facility (313), Nutrient Management (590), Roofs and Covers (367), Critical Area Planting (342).

Before Situation:

Animal mortality is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, incineration, or interaction with predators. No plan was formulated for both normal and catastrophic mortality events.

After Situation:

Animal mortality is being done in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors and protection from predators to minimize pathogen survival or spreading. An overall plan covers normal and catastrophic mortality events. Selected method for carcass treatment and disposal meet or are permitted by federal, state, and local laws, rules, regulation.

Feature Measure: Sq Feet of roof covered facility

Scenario Unit: Square Feet

Scenario Typical Size: 2,970.00

Scenario Total Cost: $203,865.30

Scenario Cost/Unit: $68.64

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Forced Air Composting with Mortality Preprocessing - Poultry/turkey Unit	2771	This force air with mortality preprocessing unit includes a preprocessing mortality shredder grinder capable of processing poultry carcasses, a roof over the composting area, and a concrete pad with forced air bins and secondary storage area. The facility can treat from 600 to 1600 lbs mortality daily with the square foot size of the facility dependent on the lbs of mortality and the number of days required secondary storage (see the sizing table).	Square Feet	$73.07	2790	$203,865.30

Practice: 316 - Animal Mortality Facility

Scenario: #57 - Forced Air Composting with mortality preprocessing Unit for Sow-Finisher Animal Size

Scenario Description:

This scenario consists of installing a manufactured Forced Air Composting with mortality preprocessing Unit for sow/hog finisher sized animal designed to handle up to 900 lbs of average daily sow/finisher mortality. The unit consist of a concrete slab with cut in forced aeration tubes, a mortality shredding/grinding machine capable of handling larger animals, area for storage of 2nd stage compost and composting material, interior concrete wall to aid in handling the compost, and a roof over the entire system. The unit will be certified by a PE to meet state requirements. After determining average daily mortality in lbs, select the size unit needed from manufacturer supplied sizing table to determine square footage of facility needed. This typical design assumed 90 days of storage needed. Payment made per unit square footage size obtained from manufacturers' product literature. This option is considered advanced mortality treatment and will requires a smaller building footprint (75-50% less) than a roofed static compost pile with concrete floor and bins. Forced aeration compost facilities will also typically have reduced odor and process mortality in less time than static bin composting. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Heavy Use Area Protection (561), Fence (382), Critical Area Planting (342), Access Road (560), Waste Storage Facility (313), Nutrient Management (590), Roofs and Covers (367), Critical Area Planting (342).

Before Situation:

Animal mortality is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, incineration, or interaction with predators. No plan was formulated for both normal and catastrophic mortality events.

After Situation:

Animal mortality is being done in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors and protection from predators to minimize pathogen survival or spreading. An overall plan covers normal and catastrophic mortality events. Selected method for carcass treatment and disposal meet or are permitted by federal, state, and local laws, rules, regulation.

Feature Measure: Square Feet of roof covered forced

Scenario Unit: Square Feet

Scenario Typical Size: 3,510.00

Scenario Total Cost: $263,495.70

Scenario Cost/Unit: $75.07

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Forced Air Composting with Mortality Preprocessing - Sow/finisher Unit	2772	This Sow/Finisher force air with mortality preprocessing unit includes a preprocessing mortality shredder grinder capable of processing hog carcasses, a roof over the composting area, and a concrete pad with forced air bins and secondary storage area. The facility can treat from 300 to 1000 lbs mortality daily with the square foot size of the facility dependent on the lbs of mortality and the number of days required secondary storage (see the sizing table).	Square Feet	$75.07	3510	$263,495.70

Practice: 316 - Animal Mortality Facility

Scenario: #83 - Poultry mortality thermal dehydration - Large

Scenario Description:

This scenario consists of installing a manufactured mortality thermal dehydration unit designed to handle 2,000 lbs of average daily mortality for the species and size of the operation. System shall use simultaneous mixing and heating to 194 degrees Fahrenheit and will result in approximately 60% mortality volume reduction over a 12-hour cycle time. After determining average daily mortality in lbs, select the smallest unit that meets capacity. Payment made based on the size of the unit obtained from manufacturers' product literature. This option is not typically least-cost. In most states a roofed static compost pile with concrete floor and bins would be considered least cost. Therefore consider reducing payment rate as per State Conservationist discretion. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed, however, in non-attainment areas, certain states may require a higher level of processing such as gasification or other approved methods. Potential Associated Practices: Heavy Use Area Protection (561), Fence (382), Critical Area Planting (342), Access Road (560), Waste Storage Facility (313), Nutrient Management (590), Roofs and Covers (367), Critical Area Planting (342).

Before Situation:

Animal mortality is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, incineration, or interaction with predators. No plan was formulated for both normal and catastrophic mortality events.

After Situation:

Animal mortality is being done in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, complete incineration, and protection from predators to minimize pathogen survival or spreading. An overall plan covers normal and catastrophic mortality events. Selected method for carcass treatment and disposal meet or are permitted by federal, state, and local laws, rules, regulation. Typical thermal dehydrator installed to handle 2,000 lbs per day average mortality for a poultry operation. Included is a 20'x20' concrete slab to set the thermal dehydrator on. Thermally dehydrated materials to be stored in suitable containers until land disposal as per the nutrient management plan or landfilled.

Feature Measure: Number of units

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $86,863.62

Scenario Cost/Unit: $86,863.62

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	8	$4,010.00
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	16	$40.32
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	2	$261.02
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	2	$57.42
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	2	$60.72
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	8	$242.88
Thermal Dehydrator, Large	2807	Poultry mortality thermal dehydrator with an capacity greater than 1,300 pounds per day. Includes equipment, shipping, and installation.	Each	$80,662.00	1	$80,662.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 316 - Animal Mortality Facility

Scenario: #84 - Poultry mortality thermal dehydration - Small

Scenario Description:

This scenario consists of installing a manufactured mortality thermal dehydration unit designed to handle up to 1,300 lbs of average daily mortality for the species and size of the operation. System shall use simultaneous mixing and heating to 194 degrees Fahrenheit and will result in approximately 60% mortality volume reduction over a 12-hour cycle time. After determining average daily mortality in lbs, select the smallest unit that meets capacity. Payment made based on the size of the unit obtained from manufacturers' product literature. This option is not typically least-cost. In most states a roofed static compost pile with concrete floor and bins would be considered least cost. Therefore consider reducing payment rate as per State Conservationist discretion. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed, however, in non-attainment areas, certain states may require a higher level of processing such as gasification or other approved methods. Potential Associated Practices: Heavy Use Area Protection (561), Fence (382), Critical Area Planting (342), Access Road (560), Waste Storage Facility (313), Nutrient Management (590), Roofs and Covers (367), Critical Area Planting (342).

Before Situation:

Animal mortality is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, incineration, or interaction with predators. No plan was formulated for both normal and catastrophic mortality events.

After Situation:

Animal mortality is being done in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, complete incineration, and protection from predators to minimize pathogen survival or spreading. An overall plan covers normal and catastrophic mortality events. Selected method for carcass treatment and disposal meet or are permitted by federal, state, and local laws, rules, regulation. Typical thermal dehydrator installed to handle up to 1300 lbs per day average mortality for a poultry operation. Included is a 16'x16' concrete slab to set the thermal dehydrator on. Thermally dehydrated materials to be stored in suitable containers until land disposal as per the nutrient management plan or landfilled.

Feature Measure: Number of units

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $71,561.67

Scenario Cost/Unit: $71,561.67

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	5	$2,506.25
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	10	$25.20
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	2	$261.02
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	2	$57.42
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	2	$60.72
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	5	$151.80
Thermal Dehydrator, Small	2806	Poultry mortality thermal dehydrator with a capacity less than or equal to 1,300 pounds per day. Includes equipment, shipping, and installation.	Each	$66,970.00	1	$66,970.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 317 - Composting Facility

Scenario: #2 - Bins with Concrete Floor

Scenario Description:

Manure, litter and other agricultural by-products are collected and stored at a composting facility until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan. This is incorporated as part of the overall waste management system meeting the National Engineering Handbook (NEH), Part 651, Agricultural Waste Management Field Handbook (AWMFH) that has been developed to also account for end use of the product from the composting facility. The composting facility consists of a series of concrete bins with a concrete floor. Water quality concerns and disease vectors resulting from improper waste disposal are addressed by providing a dedicated facility for storage and treatment and a compost product that can be used in multiple ways including land application for enrichment of crop ground is created. Concrete aprons in front of the facility shall be done using Practice Standard 561 - Heavy Use Area Protection. All animal mortality composting shall be done using Practice Standard 316 - Animal Mortality Facility. Potential Associated Practices: Pond Sealing or Lining, 520, 521 or 522, Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Structure for water control (587), Diversion (362), Pipeline (516), Subsurface Drain (606), Heavy Use Area Protection (561), Roofs and Covers (367), Roof Runoff Structure (558), Waste Storage Facility (313), Waste Recycling (633), Waste Transfer (634), Underground Outlet (620) and Vegetative Treatment Area (635), Waste Separation (632).

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source or other location or are being transported but not properly utilized or disposed of. This situation poses an environmentally threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

After Situation:

The typical composter is designed to handle organic material from a 4 house poultry operation containing 20,000 4 lbs birds in each house. The typical composting facility is 30' wide x 56' long with 5' high concrete bins, with 4-primary bins and 1 secondary bin with Storage Area. Each Bin is 30ft x 11ft. Strip top 1' of soil and roll compact same back into sub-floor. The entire structure is constructed on a 5' concrete slab used to store and stabilize organic material from a four house complex on any farm. Concrete walls are needed due to use of operators existing heavy equipment that would damage wood walls.

Feature Measure: Square Foot Floor Area

Scenario Unit: Square Feet

Scenario Typical Size: 1,680.00

Scenario Total Cost: $49,597.56

Scenario Cost/Unit: $29.52

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	26	$13,032.50
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	58.75	$33,315.95
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	32	$200.00
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yards	$3.67	63	$231.21
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	32	$971.52
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	2	$1,846.38

Practice: 317 - Composting Facility

Scenario: #6 - Composting Drum

Scenario Description:

Manure, litter and other agricultural by-products are collected and stored in a compost drum until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan. This is incorporated as part of the overall waste management system meeting the National Engineering Handbook (NEH), Part 651, Agricultural Waste Management Field Handbook (AWMFH) that has been developed to also account for end use of the product from the composting facility. The composting facility consists of a composing drum installed on a concrete slab. Water quality concerns and disease vectors resulting from improper waste disposal are addressed by providing a dedicated facility for storage and treatment and a compost product that can be used in multiple ways including land application for enrichment of crop ground is created. This scenario is applicable when geological, soil or climate conditions prohibit the use of only partial concrete surfaces. The drum system may be apart of a waste separation system where composted solids are reused as bedding, as soil amendment, or sold off farm. All animal mortality composting shall be done using Practice Standard 316 - Animal Mortality
Facility.

Potential Associated Practices: Pond Sealing or Lining, 520, 521 or 522, Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Structure for water control (587), Diversion (362), Pipeline (516), Subsurface Drain (606), Heavy Use Area Protection (561), Roofs and Covers (367), Roof Runoff Structure (558), Waste Storage Facility (313), Waste Recycling (633), Waste Transfer (634), Underground Outlet (620) and Vegetative Treatment Area (635), Waste Separation (632).

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source or other location or are being transported but not properly utilized or disposed of. This situation poses an environmentally threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

After Situation:

This scenario typically consists of a 12 cubic yard (366 cu ft) capacity composting drum that is mounted on a 50ft x 20ft concrete slab that is 5' thick to accommodate the composting drum and space for a limited amount of composting material prior to land application. The drum is loaded with organic material from a livestock operation and is turned periodically prior to final deposal which typically consists of land application. Additional transfer components are contracted separately.

Feature Measure: composting drum capacity

Scenario Unit: Cubic Feet

Scenario Typical Size: 366.00

Scenario Total Cost: $72,484.97

Scenario Cost/Unit: $198.05

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	15.4	$7,719.25
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	13	$81.25
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	2	$156.60
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	24	$1,052.88
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	2	$80.26
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	16	$777.60
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	13	$375.18
Composter, drum, 12 CY	1627	12 CY drum composter unit. Total capacity range is 10-19 CY. Includes equipment, operation controls, and shipping. Labor not included.	Each	$59,789.50	1	$59,789.50
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 317 - Composting Facility

Scenario: #13 - Windrow or Static Pile, Improved Surface

Scenario Description:

Manure, litter and other agricultural by-products are collected and stored at a composting facility until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan. This is incorporated as part of the overall waste management system meeting the National Engineering Handbook (NEH), Part 651, Agricultural Waste Management Field Handbook (AWMFH) that has been developed to also account for end use of the product from the composting facility. The composting facility consists of an improved surface to accommodate a static pile or windrow. Water quality concerns and disease vectors resulting from improper waste disposal are addressed by providing a dedicated facility for storage and treatment and a compost product that can be used in multiple ways including land application for enrichment of crop ground is created. This scenario is applicable when allowed by geological, soil, and climate conditions or by state and local regulations, where conditions or regulations prohibit the use of earth floors and require a hard working surface such as asphalt, concrete, or compacted gravel. All animal mortality composting shall must be done using Practice Standard 316 - Animal Mortality Facility. Potential Associated Practices: Pond Sealing or Lining (520, 521, 522), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Structure for water control (587), Diversion (362), Livestock Pipeline (516), Subsurface Drain (606), Heavy Use Area Protection (561), Roofs and Covers (367), Roof Runoff Structure (558), Waste Storage Facility (313), Waste Recycling (633), Waste Transfer (634), Underground Outlet (620) and Vegetative Treatment Area (635), Waste Separation (632).

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source or other location or are being transported but not properly utilized or disposed of. This situation poses an environmentally threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

After Situation:

This scenario consists of a compacted sub-base n impervious earthen floor with an asphalt improved (typical is concrete) surface over the top to act as a working area to compost organic material in a static pile or windrow that has sufficient carbon based bulking material to allow natural aeration. The improved surface prevents nutrient loading under the composting materials. Piles are typically turned at least once to go into another heat cycle prior to final deposal which typically consists of land application. A typical pad is 90' x 363' (3/4 acre) in size and consists of a 1.5 foot compacted earthen subliner -base with a 6' gravel subbase and asphalt 5' improved surface over the top. Include sufficient area for processing equipment access and utilize single piles or windrows to minimize runoff. The site is to be located out of drainage areas with off-site water or runoff diverted and spread out into a grassed area or vegetated treatment area as per regulations. Site preparation includes topsoil removal, excavation and recompaction of subsoil, placement of gravel subbase and asphalt improved surfacing and reinstalling topsoil.

Feature Measure: Square Foot Floor Area

Scenario Unit: Square Feet

Scenario Typical Size: 32,670.00

Scenario Total Cost: $297,914.80

Scenario Cost/Unit: $9.12

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	504	$252,630.00
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	1815	$7,278.15
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$56.88	6	$341.28
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yards	$3.67	2420	$8,881.40
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	6	$182.16
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	605	$18,367.80
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	2	$1,846.38
Aggregate, Shipping, Cubic Yard-mile	2360	Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul).	Cubic Yard Mile	$0.42	18150	$7,623.00

Practice: 317 - Composting Facility

Scenario: #23 - Small Farm Pad + Bins

Scenario Description:

The typical facility size is 6 feet by 9 feet and is comprised of a two-bin system, NOT TO EXCEED 75 sq-ft. The composting facility is installed on a small, urban or organic farm to address water quality concerns, pest/rodent concerns, and disease vectors resulting from improper vegetative waste disposal by providing a dedicated facility for storage and treatment, and by creating a compost product that can be used in multiple ways including land application for enrichment of crop ground. Screening is provided to limit access by vermin. Cost may be higher per unit than traditional compost facilities due to construction access limitations.

Potential Associated Practices: Pond Sealing or Lining, Compacted Soil (520), Pond Sealing or Lining, Geomembrane or Geosynthetic Clay Liner (521), Pond Sealing or Lining, Concrete (522), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Structure for Water Control (587), Diversion (362), Livestock Pipeline (516), Subsurface Drain (606), Heavy Use Area Protection (561), Roofs and Covers (367), Roof Runoff Structure (558), Waste Storage Facility (313), Waste Recycling (633), Waste Transfer (634), Underground Outlet (620) and Vegetative Treatment Area (635), Stormwater Runoff Control (570).

Before Situation:

Manure and other vegetative waste are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters.

After Situation:

Manure and other agricultural by-products are being controlled by collection at the source and properly stored at an environmentally suitable location, until such time that they are utilized in a proper manner, typically in accordance with a nutrient management plan. This is incorporated as part of the overall waste management system meeting the National Engineering Handbook (NEH), Part 651, Agricultural Waste Management Field Handbook (AWMFH) that has been developed to also account for end use of the product from the composting facility. This scenario consists of installing a composting structure on a concrete pad. Concrete pad is 6'x9' on a compacted gravel surface. Include sufficient area for accessing compost structure. Site to be located out of drainage areas, off-site water diverted and any runoff to spread out into a grassed area or vegetated treatment area as per regulations. Site preparation includes topsoil removal, compaction of subsoil, and installing a geotextile plus compacted gravel, concrete pad, and composting structure.

Feature Measure: Square Foot Floor Area

Scenario Unit: Square Feet

Scenario Typical Size: 54.00

Scenario Total Cost: $4,207.30

Scenario Cost/Unit: $77.91

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.11	6	$6.66
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	2	$12.50
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	5	$126.80
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	30	$1,316.10
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	16	$459.36
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	15	$729.00
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	2	$60.72
Concrete mix, bag	1226	Pre-mixed dry concrete mix in 60 pound bag. Materials only.	Each	$5.20	42	$218.40
Lumber, planks, posts and timbers, untreated, rot resistant	1612	Untreated dimension lumber with nominal thickness greater than 2 inches, milled from rot resistant species such as cedar. Includes lumber and fasteners. Does not include labor.	Board Feet	$4.84	264	$1,277.76

Practice: 318 - Short Term Storage of Animal Waste and By-Products

Scenario: #8 - Earthen Pad, on-site borrowed liner material

Scenario Description:
A compacted earthen pad is constructed to store wastes on a short-term basis between collection and utilization as part of an agricultural waste management system. This practice will address soil and water quality by reducing the pollution potential for surface water and groundwater quality degradation. Potential Associated Practices: Nutrient Management (590)

Before Situation:
Operator presently has a confined animal feeding operation and daily manure spreading operations. Manure and other agricultural waste by-products are not being managed in an environmentally safe manner. The wastes are either accumulating at the source, or are being stockpiled in environmentally vulnerable areas and not properly managed. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources.

After Situation:
'A compacted earthen pad provides an environmentally safe measure for temporarily managing manure and other agricultural waste by-products. This facility provides the landowner a means of storing waste until it can be utilized in a proper manner in accordance with a nutrient management plan. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Typical design: volume of material temporarily stored 16416 ft3, pad area 6,000 ft2 (60' X 100'); 6' manure stack height on 4:1 slopes.'

Feature Measure: Volume of stored manure solids

Scenario Unit: Cubic Feet

Scenario Typical Size: 16,416.00

Scenario Total Cost: $4,144.42

Scenario Cost/Unit: $0.25

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	223	$894.23
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.45	223	$769.35
Excavation, common earth, small equipment, 50 ft	1220	Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yards	$2.81	223	$626.63
Materials						
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$47.76	0.44	$21.01
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 318 - Short Term Storage of Animal Waste and By-Products

Scenario: #9 - Earthen Pad, purchased liner material

Scenario Description:

A compacted earthen pad is constructed to store wastes on a short-term basis between collection and utilization as part of an agricultural waste management system. This practice will address soil and water quality by reducing the pollution potential for surface water and groundwater quality degradation. Potential Associated Practices: Nutrient Management (590)

Before Situation:

Operator presently has a animal feeding operation and daily manure spreading operations. Manure and other agricultural waste by-products are not being managed in an environmentally safe manner. The wastes are either accumulating at the source, or are being stockpiled in environmentally vulnerable areas and not properly managed. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources.

After Situation:

'A compacted earthen pad provides an environmentally safe measure for temporarily managing manure and other agricultural waste by-products. This facility provides the landowner a means of storing waste until it can be utilized in a proper manner in accordance with a nutrient management plan. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water. Typical design: volume of material temporarily stored 16416 ft3, pad area 6,000 ft2 (60' X 100'); 6' manure stack height on 4:1 slopes.'

Feature Measure: Volume of stored manure solids

Scenario Unit: Cubic Feet

Scenario Typical Size: 16,416.00

Scenario Total Cost: $6,055.13

Scenario Cost/Unit: $0.37

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	223	$894.23
Materials						
Earthfill Material, purchased, common	2060	Purchased earthfill materials includes both silt or clay. Material only.	Cubic Yards	$19.62	223	$4,375.26
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$47.76	0.44	$21.01
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 319 - On-Farm Secondary Containment Facility

Scenario: #6 - Fueling Pad for existing fuel storage

Scenario Description:

This practice is an above ground fueling pad where existing UL 142 fuel tanks are to be used. Total fuel storage is 3,300 gallons or less. This practice addresses water degradation of surface waters or leaching into groundwater due to mis-handling, storing, loading and unloading operations by containing any drips and minor spills. The fueling area is on a reinforced concrete pad to collect any spills and drips. Tanks are to be protected with guard post. Associated Practice: Diversion (362), Critical Area Planting (342)

Before Situation:

On-farm fueling occurs on gravel driveway near machinery shed. Farm has two existing dual-wall UL 142; 1000 gallon tanks on a gravel pad. Fueling operations spills, overflows or tank leaks go un-noticed on the ground surface and contaminate the soil, surface waters and leach into the groundwater or cause excessive sediment and turbidity into surface water.

After Situation:

An above ground concrete pad is sized for an existing fuel storage for loading and unloading operations. The tanks are protected with guard post at each corner of the concrete pad and one in between the tanks. A reinforced concrete fueling pad is placed next to the tanks to contain any drips, minor spills. This scenario is a typical concrete fueling pad 14ft x 14 ft.

Feature Measure: Fueling Pad

Scenario Unit: Square Feet

Scenario Typical Size: 196.00

Scenario Total Cost: $7,963.48

Scenario Cost/Unit: $40.63

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formless, non reinforced	36	Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$220.05	2.5	$550.13
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	3.6	$1,804.50
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	2.4	$15.00
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	4	$313.20
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hours	$9.89	0.5	$4.95
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$36.34	0.5	$18.17
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	6	$172.26
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	1	$30.36
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	4	$160.52
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	2.4	$69.26
Property/Safety Signs	293	Plastic fence safety or property sign, printed on both sides with 6 pre-drilled holes for hanging or nailing. 7.5 x 4.75 inch. Includes materials and shipping only.	Each	$2.09	7	$14.63
Pipe, smooth steel, weight priced	1325	Smooth Steel pipe priced by the weight of the pipe materials. Materials only.	Pound	$3.47	906.4	$3,145.21
Fire Extinguisher, 40-B:C with Mounting Bracket	2555	Dry chemical fire extinguishers (classification 40-B:C) effective against the most common household fires: wood, paper, fabric, flammable liquid fires and live electrical equipment fires. Mounting bracket and strap are included for secure placement of extinguisher. Includes materials only.	Each	$125.04	1	$125.04

Spill Kit, Universal, 20 to 40 gal. Absorbency	2651	Universal Spill Kit for the absorption of 20 to 40 gallons of a oils, coolants, solvents, water and other petroleum products..	Each	$508.35	1	$508.35
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	60	$60.00
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Aggregate, Shipping, Cubic Yard-mile	2360	Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul).	Cubic Yard Mile	$0.42	60	$25.20

Practice: 319 - On-Farm Secondary Containment Facility

Scenario: #7 - Double Wall Tanks, Combined 3300 Gal or Less, With Fueling Pad

Scenario Description:

This practice scenario is an above ground fueling pad with three dual wall UL 142 tanks with a total fuel storage of 3300 gals or less. This practice addresses water quality degradation of surface waters or leaching into groundwater due to mis-handling, storing, loading and unloading operations by containing any drips and minor spills. Dual wall tanks provide secondary containment and are placed on a gravel surface, a reinforced concrete fueling pad is adjacent to the tanks to collect any spills and drips. Tanks are protected by guard post. Associated practices; Diversion (362), Critical Area Planting(342)

Before Situation:

On-farm fueling occurs on gravel driveway near machinery shed. Farm has three single-wall, 1000 gallon tanks. Fueling operations spills, overflows or tank leaks go un-noticed and contaminate the soil, surface waters and leach into the groundwater or cause excessive sediment and turbidity into surface water.

After Situation:

This containment is based on 3,000 gallon fuel capacity in three dual wall UL-142 tanks. This is an above ground reinforced concrete pad that is 20ft x 24ft ; 480 sf for loading and unloading of fuel subject to vehicle traffic. A gravel pad is provided under the fuel tanks; 325.5 sf for three new 1,000 gallon dual wall UL-142 tanks. Tanks are protected with guard post at each corner of the concrete pad and one in between the tanks. This practice will contain any drips, minor spills. Surface and groundwater are protected.

Feature Measure: Fuel tank gallon capacity

Scenario Unit: Gallons

Scenario Typical Size: 3,000.00

Scenario Total Cost: $55,076.32

Scenario Cost/Unit: $18.36

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formless, non reinforced	36	Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$220.05	4.5	$990.23
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	5.4	$2,706.75
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	18.6	$116.25
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	4	$313.20
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hours	$9.89	2.75	$27.20
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$36.34	4.75	$172.62
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	8	$350.96
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	6.5	$186.62
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	4.75	$144.21
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	4	$160.52
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	4	$115.44
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	14.6	$443.26
Property/Safety Signs	293	Plastic fence safety or property sign, printed on both sides with 6 pre-drilled holes for hanging or nailing. 7.5 x 4.75 inch. Includes materials and shipping only.	Each	$2.09	7	$14.63
Geotextile, non-woven, heavy weight	1210	Non-woven greater than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	$1.89	40	$75.60

Pipe, smooth steel, weight priced	1325	Smooth Steel pipe priced by the weight of the pipe materials. Materials only.	Pound	$3.47	1661.7	$5,766.10
Fire Extinguisher, 40-B:C with Mounting Bracket	2555	Dry chemical fire extinguishers (classification 40-B:C) effective against the most common household fires: wood, paper, fabric, flammable liquid fires and live electrical equipment fires. Mounting bracket and strap are included for secure placement of extinguisher. Includes materials only.	Each	$125.04	1	$125.04
Spill Kit, Universal, 20 to 40 gal. Absorbency	2651	Universal Spill Kit for the absorption of 20 to 40 gallons of a oils, coolants, solvents, water and other petroleum products..	Each	$508.35	1	$508.35
Tank, Double walled, above ground, Chemical/fuel, up to 1000 gallon	2706	Double walled above ground liquid chemical/fuel storage tank up to 1,000 gallons	Gallons	$11.07	3000	$33,210.00
Fuel Transfer Pump	2784	Fuel transfer pump for light fuel and diesel petroleum products. Typically 20-30 gallons per minute flow rate with 1/3 - 3/4 horse power motor size. Includes materials only	Each	$2,147.82	3	$6,443.46
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	1000	$1,000.00
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	2	$364.16
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26
Aggregate, Shipping, Cubic Yard-mile	2360	Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul).	Cubic Yard Mile	$0.42	744	$312.48

Practice: 319 - On-Farm Secondary Containment Facility

Scenario: #16 - Precast Containment Facility for Existing Fuel Storage

Scenario Description:

This practice scenario includes the installation of a precast concrete containment structure using an existing fuel storage tank. This containment facility will address the practice resource concerns related to water quality degradation due to the excessive release of organics into ground and surface waters or excessive sediment and turbidity in surface waters. Due to topography, limited site space and/or geological conditions a fabricated structure is needed. This containment system will provide an environmentally safe facility for handling and storage of these petroleum products.

Before Situation:

Existing agriculture operation has a single walled fuel/oil storage tank(s) without any spill prevention protection. The producer has developed an SPCC plan in accordance with EPA requirements that require an above ground secondary containment facility for on-farm oil products.

After Situation:

This scenario is based on containment for a 1150 gallon tank. The containment volume is designed for 125% of the tank volume (1100 gallons x 125% = 1436 gallons). Total structure containment volume is 1436 gallons. This containment system will provide an environmentally safe facility for handling and storage of these products. The dimensions of the containment are 8 ft x 6 ft and is 4 ft high with a 14ft x 21ft fueling pad located next to the fuel containment. The fueling pad will contain any minor drips or spills as they occur during dispensing. There is base material placed under the precast containment with bollard post installed for dispenser and containment protection from farming operation traffic.

Feature Measure: Containment Volume

Scenario Unit: Gallons

Scenario Typical Size: 1,436.00

Scenario Total Cost: $9,071.91

Scenario Cost/Unit: $6.32

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	6.4	$3,208.00
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	5	$31.25
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$56.88	6	$341.28
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hours	$9.89	1	$9.89
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$36.34	2	$72.68
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	2	$57.42
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	8	$321.04
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	4.2	$121.21
Property/Safety Signs	293	Plastic fence safety or property sign, printed on both sides with 6 pre-drilled holes for hanging or nailing. 7.5 x 4.75 inch. Includes materials and shipping only.	Each	$2.09	7	$14.63
Pipe, smooth steel, weight priced	1325	Smooth Steel pipe priced by the weight of the pipe materials. Materials only.	Pound	$3.47	302.1	$1,048.29
Culvert, box, 6 ft x 8 ft	2175	Precast concrete box culvert, 6 feet x 8 feet length. Typically in 4 foot sections. Materials only.	Feet	$442.58	4	$1,770.32
Fire Extinguisher, 40-B:C with Mounting Bracket	2555	Dry chemical fire extinguishers (classification 40-B:C) effective against the most common household fires: wood, paper, fabric, flammable liquid fires and live electrical equipment fires. Mounting bracket and strap are included for secure placement of extinguisher. Includes materials only.	Each	$125.04	1	$125.04
Spill Kit, Universal, 20 to 40 gal. Absorbency	2651	Universal Spill Kit for the absorption of 20 to 40 gallons of a oils, coolants, solvents, water and other petroleum products..	Each	$508.35	1	$508.35

Mobilization

Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	70	$70.00
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	2	$607.88
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 319 - On-Farm Secondary Containment Facility

Scenario: #17 - Secondary Containment Structure

Scenario Description:

This practice scenario includes the installation of a secondary wall type containment using an existing fuel storage tank. With secondary containment resource concerns related to water quality degradation due to the excessive release of organics into ground and surface waters or excessive sediment and turbidity in surface waters. Due to topography, limited site space and/or geological conditions a fabricated structure is needed. Structure will provide an environmentally safe facility for handling and storage of these products. Associated practices may include; Heavy Use Area Protection (561).

Before Situation:

Existing agricultural operation that has single walled fuel/oil storage tank(s) not protected. The producer has developed an SPCC plan in accordance with EPA requirements requiring an above ground secondary containment facility for on-farm oil products, in order to control the excessive release of organics into ground and surface waters, or to control the excessive sediment and turbidity in surface water.

After Situation:

This scenario is based on containment for a 4,700 gallon tank. The containment volume is for 125% of the tank volume (4,700 gallons x 125% = 5,875 gallons). This fabricated secondary containment structure will provide an environmentally safe facility for handling and storage of these products. Typical containment dimensions (28 ft x 10 ft) are 280 sq.ft. bottom with a 6' thick slab with reinforced concrete walls; 8' thick, 4 ft tall with a 5'-6' footer. The existing tanks will be moved or raised to install base materials. The secondary containment structure (earthen berm, metal walls, concrete walls or modular block walls) will be installed in conformance wit the design and specifications. The on-farm oil products stored on the have secondary containment of accidental release that controls the excessive release of organics, suspended sediments, and turbidity resource concerns. Structure will provide an environmentally safe facility for handling and storage of these products.

Feature Measure: Containment Volume

Scenario Unit: Gallons

Scenario Typical Size: 5,875.00

Scenario Total Cost: $19,372.81

Scenario Cost/Unit: $3.30

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	5.4	$2,706.75
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	19	$10,774.52
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	10	$62.50
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$56.88	1	$56.88
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hours	$9.89	1	$9.89
Crane, truck mounted, hydraulic, 12 ton	1734	12 ton capacity truck mounted hydraulic crane. Equipment cost only.	Hours	$284.50	2	$569.00
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	8	$350.96
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	3	$120.39
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	10	$288.60
Property/Safety Signs	293	Plastic fence safety or property sign, printed on both sides with 6 pre-drilled holes for hanging or nailing. 7.5 x 4.75 inch. Includes materials and shipping only.	Each	$2.09	7	$14.63
Pipe, smooth steel, weight priced	1325	Smooth Steel pipe priced by the weight of the pipe materials. Materials only.	Pound	$3.47	302.1	$1,048.29

Fire Extinguisher, 40-B:C with Mounting Bracket	2555	Dry chemical fire extinguishers (classification 40-B:C) effective against the most common household fires: wood, paper, fabric, flammable liquid fires and live electrical equipment fires. Mounting bracket and strap are included for secure placement of extinguisher. Includes materials only.	Each	$125.04	1	$125.04
Spill Kit, Universal, 20 to 40 gal. Absorbency	2651	Universal Spill Kit for the absorption of 20 to 40 gallons of a oils, coolants, solvents, water and other petroleum products..	Each	$508.35	1	$508.35
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	2	$1,846.38
Aggregate, Shipping, Cubic Yard-mile	2360	Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul).	Cubic Yard Mile	$0.42	300	$126.00

Practice: 319 - On-Farm Secondary Containment Facility

Scenario: #23 - Double Wall Tank, Combined Greater Than 3300 Gal, With Fueling Pad

Scenario Description:

This practice scenario includes the replacement of an existing single wall fuel storage tank with a new double wall tank. The purpose of the practice is to address resource concerns related to water quality degradation due to the excessive release of organics into ground and surface waters or excessive sediment and turbidity in surface waters.Associated practices: Heavy Use Area Protection (561).

Before Situation:

The agricultural operation has an existing single wall fuel/oil storage tank(s) without any spill prevention protection. The producer has developed an SPCC plan in accordance with EPA requirements, which requires an above ground secondary containment facility for on-farm oil products.

After Situation:

This scenario is based on the replacement of an existing single wall tank(s) with a new double wall tank(s). Installation of 'used' double wall tank(s) will not be allowed. A 4000 gallon horizontal or vertical antiroll tank (U/L 142-23 Secondary Containment Vessel) double walled which meets EPA regulations will be installed. Payment Schedule is based on a new double wall tank of the same size. The double wall tank will provide an environmentally safe facility for handling and storage of oil products stored on the farm. Any accidental spills will be contained.

Feature Measure: Tank volume

Scenario Unit: Gallons

Scenario Typical Size: 4,000.00

Scenario Total Cost: $39,742.93

Scenario Cost/Unit: $9.94

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formless, non reinforced	36	Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$220.05	3.3	$726.17
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	8	$4,010.00
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	9	$56.25
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	4	$313.20
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hours	$9.89	2	$19.78
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$36.34	2	$72.68
Concrete, CIP, Slab on Grade, non reinforced	1225	Non reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$309.79	3.2	$991.33
Crane, truck mounted, hydraulic, 12 ton	1734	12 ton capacity truck mounted hydraulic crane. Equipment cost only.	Hours	$284.50	2	$569.00
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	8	$350.96
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	2	$60.72
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	6	$240.78
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	9	$259.74
Property/Safety Signs	293	Plastic fence safety or property sign, printed on both sides with 6 pre-drilled holes for hanging or nailing. 7.5 x 4.75 inch. Includes materials and shipping only.	Each	$2.09	7	$14.63

Pipe, smooth steel, weight priced	1325	Smooth Steel pipe priced by the weight of the pipe materials. Materials only.	Pound	$3.47	1208.5	$4,193.50
Tank, storage tank, double wall, 4000 gallon, horizontal, steel, above ground	1733	Double wall horizontal steel storage tank. Includes cradles, coating, fittings, labor, equipment. Excludes foundations, pumps or piping.	Gallons	$5.34	4000	$21,360.00
Fire Extinguisher, 40-B:C with Mounting Bracket	2555	Dry chemical fire extinguishers (classification 40-B:C) effective against the most common household fires: wood, paper, fabric, flammable liquid fires and live electrical equipment fires. Mounting bracket and strap are included for secure placement of extinguisher. Includes materials only.	Each	$125.04	1	$125.04
Spill Kit, Universal, 20 to 40 gal. Absorbency	2651	Universal Spill Kit for the absorption of 20 to 40 gallons of a oils, coolants, solvents, water and other petroleum products..	Each	$508.35	1	$508.35
Fuel Transfer Pump	2784	Fuel transfer pump for light fuel and diesel petroleum products. Typically 20-30 gallons per minute flow rate with 1/3 - 3/4 horse power motor size. Includes materials only	Each	$2,147.82	1	$2,147.82
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	600	$600.00
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	3	$2,293.89
Aggregate, Shipping, Cubic Yard-mile	2360	Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul).	Cubic Yard Mile	$0.42	270	$113.40

Practice: 324 - Deep Tillage

Scenario: #5 - Deep Tillage less than 20 inches

Scenario Description:
Fields (80 acres) with adverse soils conditions that restrict plant growth such as compacted layers caused by tillage operations or restrictive layers such as hardpans (duripans) in the root zone. This practice does not apply to normal tillage practices to prepare a seedbed but is meant to fracture the restrictive soil layer.

Before Situation:
In this geographic area, crop plants are observed as having reduced yield, water is not infiltrating into the soil. Soil layers have been compacted by shallow tillage operations, or soils have a hardpan (duripan) layer that is restricting root growth. Typical field size is 80 acres with crop rotations consisting of annual row crops or small grains with conventional tillage or when the harvesting of row crops (onions, sugar beets, potato, and corn silage) use heavy trucks to assist with the harvest. Compaction has been caused when soil moisture is too wet for normal field operations or by excessive shallow tillage or field harvest haul traffic throughout the entire field. Soil structure has been reduced, aggregate strength is weak and soil biological activity is low. Soil organic matter is not adequate and the water holding capacity of the soil is limited for the desired root zone.

After Situation:
Soil compaction is measured with a penetrometer and visual observation of limiting root growth. Deep tillage operations such as subsoiling, paratilling or ripping are performed not as a part of the normal tillage operation for seedbed preparation, but used to relieve compaction at depths less than 20 inches. Soil moisture is less than 30 percent when deep tillage is used. The fractured zone will be sufficient to permit root penetration below the restrictive soil layer. Penetrometers are used to identify the severity (psi) of the compaction and the depth of the restrictive layer. Deep tillage is generally performed in the fall after crop harvest when soil conditions are dry. After deep tillage, harvest operations should be avoided when soil moisture is greater than 50% of field capacity. Field harvest haul traffic should be limited to end rows or haul roads. Using dual tires or tracks beneath tractors or grain wagons can help spread the weight load.

Feature Measure: <Unknown>

Scenario Unit: Acres

Scenario Typical Size: 80.00

Scenario Total Cost: $2,194.48

Scenario Cost/Unit: $27.43

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	1	$25.36
Ripper or subsoiler, 16 to 36 inch depth	1235	Deep ripper or subsoiler, (16-36 inches depth) includes tillage implement, power unit and labor.	Acres	$23.61	80	$1,888.80
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	2	$57.42
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	2	$222.90

Practice: 324 - Deep Tillage

Scenario: #6 - Deep Tillage more than 20 inches

Scenario Description:
Fields (80 acres) with adverse soils conditions that restrict plant growth such as compacted layers caused by tillage operations or restrictive layers such as hardpans (duripans) in the root zone. This practice does not apply to normal tillage practices to prepare a seedbed but is meant to fracture the restrictive soil layer.

Before Situation:
In this geographic area, crop plants are observed as having reduced yield, water is not infiltrating into the soil. Soil layers have been compacted by shallow tillage operations, or soils have a hardpan (duripan) layer that is restricting root growth. Typical field size is 80 acres with crop rotations consisting of annual row crops, orchard /vineyards or small grains with conventional tillage or when the harvesting of row crops (onions, sugar beets, potato, and corn silage) use heavy trucks to assist with the harvest. Orchards and vineyards may be deep ripped prior to establishment of perennial crop. Compaction has been caused when soil moisture is too wet for normal field operations or by excessive shallow tillage or field harvest haul traffic throughout the entire field. Soil structure has been reduced, aggregate strength is weak and soil biological activity is low. Soil organic matter is not adequate and the water holding capacity of the soil is limited for the desired root zone.

After Situation:
Soil compaction is measured with a penetrometer and visual observation of limiting root growth. Deep tillage operations such as subsoiling, paratilling or ripping are performed not as a part of the normal tillage operation for seedbed preparation, but used to relieve compaction at depths more than 20 inches. Soil moisture is less than 30 percent when deep tillage is used. The fractured zone will be sufficient to permit root penetration below the restrictive soil layer. Penetrometers are used to identify the severity (psi) of the compaction and the depth of the restrictive layer. Deep tillage is generally performed in the fall after crop harvest when soil conditions are dry. When possible, harvest operations should be avoided when soil moisture is greater than 50% of field capacity. Field harvest haul traffic should be limited to end rows or haul roads. Using dual tires or tracks beneath tractors or grain wagons can help spread the weight load.

Feature Measure: <Unknown>

Scenario Unit: Acres

Scenario Typical Size: 80.00

Scenario Total Cost: $5,142.48

Scenario Cost/Unit: $64.28

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	1	$25.36
Ripper or subsoiler, > 36 inch depth	1236	Deep ripper or subsoiler, (>36 inches depth) includes tillage implement, power unit and labor.	Acres	$60.46	80	$4,836.80
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	2	$57.42
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	2	$222.90

Practice: 325 - High Tunnel System

Scenario: #42 - Contiguous US Snow

Scenario Description:
Used for contiguous US states in areas with high snowfall. A gothic style (peaked) manufactured frame of tubular steel (30 x 70 ft.) with end walls and/or truss supports covered with 4-year 6 mil plastic. Costs are based on purchase of manufactured kit and landowner installing the structure. Structure must be installed to manufacturer's specifications.

Before Situation:
Cropland where extension of the growing season is needed. Additional resource concerns that may need to be addressed include soil erosion, soil condition, water quality, water quantity, and plant condition.

After Situation:
A high tunnel structure has been installed and he growing season has been extended for 1-4 months on average. Plant health and vigor has been improved.

Feature Measure: Area of Tunnel Installed

Scenario Unit: Square Feet

Scenario Typical Size: 2,160.00

Scenario Total Cost: $16,747.56

Scenario Cost/Unit: $7.75

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	71	$2,038.41
Materials						
High Tunnel, Gothic Style, Fixed Cost	2791	Fixed cost portion of a gothic style high tunnel. Includes heavy-duty, gothic framework complete with all predrilled steel, hardware and instructions. Includes 6 mil 4-year polyethylene film to cover tunnel, roll-up sides, lumber, and polylock for sides and ends for a gothic style (peaked top) hoop house. Materials and shipping only.	Number	$2,447.65	1	$2,447.65
High Tunnel, Gothic Style, Variable Cost	2792	Variable cost portion of a Gothic style high tunnel. Includes heavy-duty, gothic framework complete with all predrilled steel, hardware and instructions. Includes 6 mil 4-year polyethylene film to cover tunnel, roll-up sides, lumber, and polylock for sides and ends for a gothic style (peaked top) hoop house. Includes materials and shipping only.	Square Feet	$3.84	2160	$8,294.40
High Tunnel, End Walls	2799	Includes frame, polyvinyl covering, and appurtenances. Price is for two end walls based on the width of the structure. Manufactured doors not included. Includes material and shipping only.	Feet	$52.93	30	$1,587.90
High Tunnel, Truss Supports	2800	Rafter or truss support system on Seasonal High Tunnels to add strength for wind or snow load. Based on the area of the structure (square feet). Includes materials and shipping only.	Square Feet	$0.87	2160	$1,879.20
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	500	$500.00

Practice: 325 - High Tunnel System

Scenario: #70 - Small High Tunnel, Snow and Wind

Scenario Description:
Use in areas with expected snow and wind loads on sites less than 1 acre. Gothic-style (arched) manufactured frame of tubular steel (less than or equal to 20 ft x 30 ft.) covered with 4-year warrantee, 6 mil UV resistant plastic. Costs are based on purchase of manufactured kit and landowner installation of structure. Structure must be installed to manufacturer's specifications. Associated practices might include CPS Roof Runoff Structure (588), Underground Outlet (620), Critical Area Planting (342), Mulching (484).

Before Situation:
Cropland where extension of the growing season is needed. Primary resource concern addressed will be plant health and vigor.

After Situation:
High Tunnel structure has been installed and the growing season has been extended for 1-4 months on average. Plant health and vigor is improved.

Feature Measure: Area of High Tunnel Installed

Scenario Unit: Square Feet

Scenario Typical Size: 600.00

Scenario Total Cost: $7,968.72

Scenario Cost/Unit: $13.28

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	57	$1,636.47
Materials						
High Tunnel, Gothic Style, Fixed Cost	2791	Fixed cost portion of a gothic style high tunnel. Includes heavy-duty, gothic framework complete with all predrilled steel, hardware and instructions. Includes 6 mil 4-year polyethylene film to cover tunnel, roll-up sides, lumber, and polylock for sides and ends for a gothic style (peaked top) hoop house. Materials and shipping only.	Number	$2,447.65	1	$2,447.65
High Tunnel, Gothic Style, Variable Cost	2792	Variable cost portion of a Gothic style high tunnel. Includes heavy-duty, gothic framework complete with all predrilled steel, hardware and instructions. Includes 6 mil 4-year polyethylene film to cover tunnel, roll-up sides, lumber, and polylock for sides and ends for a gothic style (peaked top) hoop house. Includes materials and shipping only.	Square Feet	$3.84	600	$2,304.00
High Tunnel, End Walls	2799	Includes frame, polyvinyl covering, and appurtenances. Price is for two end walls based on the width of the structure. Manufactured doors not included. Includes material and shipping only.	Feet	$52.93	20	$1,058.60
High Tunnel, Truss Supports	2800	Rafter or truss support system on Seasonal High Tunnels to add strength for wind or snow load. Based on the area of the structure (square feet). Includes materials and shipping only.	Square Feet	$0.87	600	$522.00

Practice: 325 - High Tunnel System

Scenario: #152 - Small High Tunnel, Low Snow and Wind

Scenario Description:
Use in areas with low expected snow and wind loads on sites less than 1 acre. Quonset-style (round) manufactured frame of tubular steel (less than or equal to 20 ft x 30 ft.) covered with 4-year warrantee, 6 mil UV resistant plastic. Costs are based on purchase of manufactured kit and landowner installation of structure. Structure must be installed to manufacturer's specifications. Associated practices might include CPS Roof Runoff Structure (588), Underground Outlet (620), Critical Area Planting (342), Mulching (484).

Before Situation:
Cropland where extension of the growing season is needed. Primary resource concern addressed will be plant health and vigor.

After Situation:
High Tunnel structure has been installed and the growing season has been extended for 1-4 months on average. Plant health and vigor is improved.

Feature Measure: Area of High Tunnel Installed

Scenario Unit: Square Feet

Scenario Typical Size: 600.00

Scenario Total Cost: $5,457.67

Scenario Cost/Unit: $9.10

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	57	$1,636.47
Materials						
High Tunnel, Quonset Style, Fixed Cost	2789	Fixed cost portion of a quonset style high tunnel. Includes the framework complete with all predrilled steel, hardware and instructions. Includes 6 mil 4-year polyethylene film to cover tunnel, and poly-lock for sides and ends for a quonset style (round top) hoop house. Materials and shipping only.	Number	$1,955.20	1	$1,955.20
High Tunnel, Quonset style, Variable Cost	2790	Variable cost portion of a quonset style high tunnel. Includes the framework complete with all predrilled steel, hardware and instructions. Includes 6 mil 4-year polyethylene film to cover tunnel, and poly-lock for sides and ends for a quonset style (round top) hoop house. Materials and shipping only.	Square Feet	$3.11	600	$1,866.00

Practice: 325 - High Tunnel System

Scenario: #153 - Small High Tunnel, Intensive Sun

Scenario Description:
Use in areas with low expected snow and wind loads on sites less than 1 acre. Quonset-style (round) manufactured frame of tubular steel (less than or equal to 20 ft x 30 ft.) covered with 4-year warrantee, 6 mil UV resistant plastic. Costs are based on purchase of manufactured kit and landowner installation of structure. Structure must be installed to manufacturer's specifications. Associated practices might include CPS Roof Runoff Structure (588), Underground Outlet (620), Critical Area Planting (342), Mulching (484).

Before Situation:
Cropland where extension of the growing season is needed. Primary resource concern addressed will be plant health and vigor.

After Situation:
High Tunnel structure has been installed and the growing season has been extended for 1-4 months on average. Plant health and vigor is improved.

Feature Measure: Area of High Tunnel Installed

Scenario Unit: Square Feet

Scenario Typical Size: 600.00

Scenario Total Cost: $5,637.67

Scenario Cost/Unit: $9.40

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	57	$1,636.47
Materials						
High Tunnel, Quonset Style, Fixed Cost	2789	Fixed cost portion of a quonset style high tunnel. Includes the framework complete with all predrilled steel, hardware and instructions. Includes 6 mil 4-year polyethylene film to cover tunnel, and poly-lock for sides and ends for a quonset style (round top) hoop house. Materials and shipping only.	Number	$1,955.20	1	$1,955.20
High Tunnel, Quonset style, Variable Cost	2790	Variable cost portion of a quonset style high tunnel. Includes the framework complete with all predrilled steel, hardware and instructions. Includes 6 mil 4-year polyethylene film to cover tunnel, and poly-lock for sides and ends for a quonset style (round top) hoop house. Materials and shipping only.	Square Feet	$3.11	600	$1,866.00
Shade cloth	2793	Knitted or woven, high tensile, UV resistant shade cloth of a minimum of 30% sunlight control. Includes grommets with reinforced edging. Materials and shipping only.	Square Feet	$0.30	600	$180.00

Practice: 325 - High Tunnel System

Scenario: #154 - High Tunnel Round with Gutters

Scenario Description:
Use in areas with low expected snow and wind loads. Quonset-style (round) manufactured frame of tubular steel (30 x 72 ft.) covered with 4-year 6 mil plastic. Gutters and downspout on each side direct water away from high tunnel. Costs are based on purchase of manufactured kit and landowner installation of structure. Structure must be installed to manufacturer's specifications.Associated practices might include CPS Roof Runoff Structure (588), Underground Outlet (620), Critical Area Planting (342), Mulching (484).

Before Situation:
Cropland where extension of the growing season is needed. Primary resource concern addressed will be plant health and vigor.

After Situation:
High Tunnel structure has been installed and the growing season has been extended for 1-4 months on average. Plant health and vigor is improved.

Feature Measure: Area of Tunnel Installed

Scenario Unit: Square Feet

Scenario Typical Size: 2,160.00

Scenario Total Cost: $13,030.09

Scenario Cost/Unit: $6.03

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	71	$2,038.41
Materials						
Gutter, Downspout, PVC, 5 in.	1388	5 inch PVC guttering. Materials only.	Feet	$1.28	12	$15.36
Lumber, planks, posts and timbers, treated	1609	Treated dimension lumber with nominal thickness greater than 2 inches. Includes lumber and fasteners. Does not include labor.	Board Feet	$3.53	48	$169.44
Gutter, Galvanized Steel, Medium	1693	Galvanized Steel gutter, 7 to 9 in. width with hangers. Materials only.	Feet	$14.82	144	$2,134.08
High Tunnel, Quonset Style, Fixed Cost	2789	Fixed cost portion of a quonset style high tunnel. Includes the framework complete with all predrilled steel, hardware and instructions. Includes 6 mil 4-year polyethylene film to cover tunnel, and poly-lock for sides and ends for a quonset style (round top) hoop house. Materials and shipping only.	Number	$1,955.20	1	$1,955.20
High Tunnel, Quonset style, Variable Cost	2790	Variable cost portion of a quonset style high tunnel. Includes the framework complete with all predrilled steel, hardware and instructions. Includes 6 mil 4-year polyethylene film to cover tunnel, and poly-lock for sides and ends for a quonset style (round top) hoop house. Materials and shipping only.	Square Feet	$3.11	2160	$6,717.60

Practice: 325 - High Tunnel System

Scenario: #155 - Small Tunnel with Gutter

Scenario Description:
Use in areas with low expected snow and wind loads. Quonset-style (round) manufactured frame of tubular steel (30 x 72 ft.) covered with 4-year 6 mil plastic. Runoff is captured in gutters placed on tunnel sides and conveys water away from the high tunnel reducing erosion or to catch and reuse water. Costs are based on purchase of manufactured kit and landowner installation of structure. Structure must be installed to manufacturer's specifications. Associated practices might include CPS Roof Runoff Structure (588), Underground Outlet (620), Critical Area Planting (342), Mulching (484).

Before Situation:
Cropland where extension of the growing season is needed. Primary resource concern addressed will be plant health and vigor.

After Situation:
High Tunnel structure has been installed and the growing season has been extended for 1-4 months on average. Plant health and vigor is improved. Gutters convey water to reduce soil erosion, ponding near the high tunnel, and or catchment for water reuse.

Feature Measure: Area of High Tunnel Installed

Scenario Unit: Square Feet

Scenario Typical Size: 600.00

Scenario Total Cost: $6,469.53

Scenario Cost/Unit: $10.78

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	57	$1,636.47
Materials						
Gutter, Downspout, PVC, 5 in.	1388	5 inch PVC guttering. Materials only.	Feet	$1.28	12	$15.36
Lumber, planks, posts and timbers, treated	1609	Treated dimension lumber with nominal thickness greater than 2 inches. Includes lumber and fasteners. Does not include labor.	Board Feet	$3.53	22	$77.66
Gutter, Galvanized Steel, Medium	1693	Galvanized Steel gutter, 7 to 9 in. width with hangers. Materials only.	Feet	$14.82	62	$918.84
High Tunnel, Quonset Style, Fixed Cost	2789	Fixed cost portion of a quonset style high tunnel. Includes the framework complete with all predrilled steel, hardware and instructions. Includes 6 mil 4-year polyethylene film to cover tunnel, and poly-lock for sides and ends for a quonset style (round top) hoop house. Materials and shipping only.	Number	$1,955.20	1	$1,955.20
High Tunnel, Quonset style, Variable Cost	2790	Variable cost portion of a quonset style high tunnel. Includes the framework complete with all predrilled steel, hardware and instructions. Includes 6 mil 4-year polyethylene film to cover tunnel, and poly-lock for sides and ends for a quonset style (round top) hoop house. Materials and shipping only.	Square Feet	$3.11	600	$1,866.00

Practice: 325 - High Tunnel System

Scenario: #156 - Small Gothic HT with Gutter

Scenario Description:
Use in areas with low expected snow and wind loads on sites less than 1 acre. Gothic-style (arched) manufactured frame of tubular steel (less than or equal to 20 ft x 30 ft.) covered with 4-year warrantee, 6 mil UV resistant plastic. Gutter placed on each side to capture and convey runoff away from the tunnel. Costs are based on purchase of manufactured kit and landowner installation of structure. Structure must be installed to manufacturer's specifications. Associated practices might include CPS Roof Runoff Structure (588), Underground Outlet (620), Critical Area Planting (342), Mulching (484).

Before Situation:
Cropland where extension of the growing season is needed. Primary resource concern addressed will be plant health and vigor.

After Situation:
High Tunnel structure has been installed and the growing season has been extended for 1-4 months on average. Plant health and vigor is improved. Gutter system reduces soil erosion and ponding and or conveys water to a catchment for reuse.

Feature Measure: Area of High Tunnel Installed

Scenario Unit: Square Feet

Scenario Typical Size: 600.00

Scenario Total Cost: $7,396.45

Scenario Cost/Unit: $12.33

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	57	$1,636.47
Materials						
Gutter, Downspout, PVC, 5 in.	1388	5 inch PVC guttering. Materials only.	Feet	$1.28	12	$15.36
Lumber, planks, posts and timbers, treated	1609	Treated dimension lumber with nominal thickness greater than 2 inches. Includes lumber and fasteners. Does not include labor.	Board Feet	$3.53	21	$74.13
Gutter, Galvanized Steel, Medium	1693	Galvanized Steel gutter, 7 to 9 in. width with hangers. Materials only.	Feet	$14.82	62	$918.84
High Tunnel, Gothic Style, Fixed Cost	2791	Fixed cost portion of a gothic style high tunnel. Includes heavy-duty, gothic framework complete with all predrilled steel, hardware and instructions. Includes 6 mil 4-year polyethylene film to cover tunnel, roll-up sides, lumber, and polylock for sides and ends for a gothic style (peaked top) hoop house. Materials and shipping only.	Number	$2,447.65	1	$2,447.65
High Tunnel, Gothic Style, Variable Cost	2792	Variable cost portion of a Gothic style high tunnel. Includes heavy-duty, gothic framework complete with all predrilled steel, hardware and instructions. Includes 6 mil 4-year polyethylene film to cover tunnel, roll-up sides, lumber, and polylock for sides and ends for a gothic style (peaked top) hoop house. Includes materials and shipping only.	Square Feet	$3.84	600	$2,304.00

Practice: 326 - Clearing and Snagging

Scenario: #16 - Clearing and Snagging - Medium

Scenario Description:
Removal of vegetation, logs, or other material that impedes the proper functioning on 200 to 400 linear feet of a stream channel or water course to restore flow capacity; prevent bank erosion by eddies; reduce the formation of sediment bars; and/or minimize blockages by debris. Addresses resource concerns such as water quantity and soil erosion-streambanks.

Before Situation:
Vegetation, logs, or other material provide a flow restriction or divert flowing water against the streambank causing excess erosion. Approximately one-half of the channel flow capacity is obstructed. The flow blockage may encourage depostion in the main channel and may alter the established flow channel.

After Situation:
Vegetation, logs, or other material have been removed to allow unrestricted flow in the channel and appurtenant structures. Material that poses no blockage threat is left in place to enhance aquatic habitat. Channel bed and banks are in equillibrium with the flow.

Feature Measure: Linear Feet

Scenario Unit: Feet

Scenario Typical Size: 300.00

Scenario Total Cost: $6,432.04

Scenario Cost/Unit: $21.44

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$100.26	10	$1,002.60
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	10	$1,305.10
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	20	$126.00
Truck, dump, 8 CY	1401	Dump truck for moving bulk material. Typically capacity is 12 ton or 8 cubic yards. Includes equipment only.	Hours	$55.22	10	$552.20
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	16	$459.36
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	32	$971.52
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	10	$486.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 327 - Conservation Cover

Scenario: #1 - Introduced Species

Scenario Description:

The land is covered with permanent non-native grass vegetation resulting in reduced soil erosion and water/sediment runoff, and the elimination of dust emissions which improves air quality significantly. Plants sown for conservation cover may provide cover for beneficial insects and wildlife. This scenario does not apply to plantings for forage production or to critical area plantings. Applies to conventional or organic systems.

Before Situation:

Crops such as corn, soybeans, or cotton may be conventionally or organically grown and harvested. Full width tillage is utilized, weeds controlled by cultivation and/or chemical application. Soil surface residue amounts average 10% or less. Soil erosion exceed allowable tolerance, sediment may be moving offsite into surface water degrading water quality. Soil quality (soil organic matter) declines over time as a result of tillage practices, low residue, and long periods of bare soil. Air quality may be impacted during field operations by the creation of particulates. The system provides little to no wildlife habitat.

After Situation:

The 327 Implementation Requirements have been developed for the site and applied. The land is covered with permanent non-native grass vegetation resulting in reduced soil erosion and water/sediment runoff, and the elimination of significant dust emissions which improves air quality. Plants sown for conservation cover may provide cover for beneficial insects and wildlife. This scenario does not apply to plantings for forage production or to critical area plantings.

Feature Measure: Area planted

Scenario Unit: Acres

Scenario Typical Size: 50.00

Scenario Total Cost: $10,837.50

Scenario Cost/Unit: $216.75

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	150	$2,232.00
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.61	50	$380.50
Mechanical weed control, Vegetation termination	957	Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs.	Acres	$27.07	50	$1,353.50
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	50	$1,113.50
Materials						
Nitrogen (N), Ammonium Nitrate	69	Price per pound of N supplied by Ammonium Nitrate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.70	2500	$1,750.00
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.81	2000	$1,620.00
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$47.76	50	$2,388.00

Practice: 327 - Conservation Cover

Scenario: #2 - Native Species

Scenario Description:

This practice applies on land to be retired from agricultural production and on other lands needing permanent protective cover. This practice typically involves conversion from a clean-tilled (conventional tilled) intensive cropping system to permanent native vegetation (scenario includes native grass). The typical size of the practice is 50 acres. This practice scenario is typically used to reduce soil erosion, reduce soil quality degradation, improve water quality, develop wildlife habitat, and reduce air quality impacts. Applies to conventional or organic systems

Before Situation:

Crops such as corn, soybeans, or cotton may be conventionally or organically grown and harvested. Full width tillage is utilized, weeds controlled by cultivation and/or chemical application. Soil surface residue amounts average 10% or less. Soil erosion exceeds allowable tolerance, and sediment may be moving offsite into surface water degrading water quality. Soil quality (soil organic matter) declines over time as a result of tillage practices, low residue, and long periods of bare soil. Air quality may be impacted during field operations by the creation of particulates. The system provides little to no wildlife habitat.

After Situation:

The 327 Implementation Requirements have been developed for the site and applied. The land is covered with permanent native grass vegetation which reduces soil erosion and water/sediment runoff, and eliminates dust emissions which improves air quality. Plants sown for conservation cover may provide cover for beneficial insects and wildlife. This scenario does not apply to plantings for forage production or to critical area plantings.

Feature Measure: Area planted

Scenario Unit: Acres

Scenario Typical Size: 50.00

Scenario Total Cost: $12,801.00

Scenario Cost/Unit: $256.02

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	150	$2,232.00
Mechanical weed control, Vegetation termination	957	Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs.	Acres	$27.07	100	$2,707.00
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	50	$1,113.50
Materials						
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$134.97	50	$6,748.50

Practice: 327 - Conservation Cover

Scenario: #3 - Orchard or Vineyard Alleyways

Scenario Description:

This practice applies on orchards and vineyards needing permanent protective cover in the alleyways between tree and vine rows. The typical size of this practice is 20 acres. This practice typically involves conversion from a clean-tilled (conventional tilled) intensive cropping system to permanent vegetation (scenario includes non-native grass and legume mix). This practice scenario is typically used to reduce soil erosion, reduce soil quality degradation, improve water quality, enhance wildlife and/or pollinator habitat, manage plant pests, and reduce air quality impacts. Typically 60% of the surface area is conservation cover per acre.

Before Situation:

Orchard or vineyard with bare soil between vine/tree rows. Bare soil is exposed to wind erosion and/or intense rainfall during the fall, winter, and early spring. Over the winter sediment/nutrient runoff from orchards/vineyards increases. Soil erosion exceeds tolerable levels. Runoff from the fields flows into streams, water courses or other water bodies causing degradation to the receiving waters. Soil health (soil organic matter) declines over time as a result of long periods of bare soil. Little to no wildlife/pollinator habitat is present.

After Situation:

The 327 Implementation Requirements have been developed for the site and has been applied. Orchard or Vineyard area between vine/tree rows are planted with permanent introduced grass/legume mix. Area covered has reduced soil erosion, reduced water/sediment runoff, and improved air quality as a result of the elimination of significant amounts of dust emissions.. Plants sown for conservation cover may provide cover for beneficial insects, pollinators, and wildlife.

Feature Measure: Area planted

Scenario Unit: Acres

Scenario Typical Size: 20.00

Scenario Total Cost: $3,073.68

Scenario Cost/Unit: $153.68

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	24	$357.12
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.61	12	$91.32
Mechanical weed control, Vegetation termination	957	Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs.	Acres	$27.07	24	$649.68
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	12	$267.24
Materials						
Nitrogen (N), Ammonium Nitrate	69	Price per pound of N supplied by Ammonium Nitrate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.70	600	$420.00
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.81	480	$388.80
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	480	$326.40
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$47.76	12	$573.12

Practice: 327 - Conservation Cover

Scenario: #4 - Pollinator Species

Scenario Description:

Permanent vegetation, including a mix of native grasses, legumes, and forbs (mix may also include non-native species), established on any land needing permanent vegetative cover that provides habitat for pollinators. Typical practice size is variable depending on site; this scenario uses 1 ac as the typical size. In addition to providing pollinator habitat, this practice scenario may also reduce sheet, rill, and wind erosion, improve soil quality, improve water quality, and improve air quality. The practice may also provide wildlife habitat. Practice applicable on cropland, odd areas, corners, etc. Applies to conventional or organic systems.

Before Situation:

Crops such as corn, soybeans, or cotton may be conventionally or organically grown and harvested. Full width tillage is utilized, weeds controlled by cultivation and/or chemical application. Soil surface residue amounts average 10% or less. Erosion exceeds tolerable rates and sediment may be moving offsite into surface water degrading water quality. Soil quality (soil organic matter) declines over time as a result of tillage practices, low residue, and long periods of bare soil. Air quality may be impacted during field operations by the creation of particulates. The system provides little to no wildlife or pollinator habitat.

After Situation:

The 327 Implementation Requirements have been developed for the site and applied. Land is covered with permanent pollinator habitat including a mix of native grasses, legumes, forbs (mix may also include non-native species). This practice may also have reduced soil erosion, reduced water/sediment runoff, and improved air quality as a result of the elimination of dust emissions. Plants sown for pollinator habitat may also provide cover for beneficial insects and wildlife. This scenario does not apply to critical area plantings.

Feature Measure: Area planted

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $791.70

Scenario Cost/Unit: $791.70

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	1	$25.36
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	3	$44.64
Mechanical weed control, Vegetation termination	957	Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs.	Acres	$27.07	2	$54.14
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	1	$22.27
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	4	$175.48
Materials						
Native Perennial Grasses, Legumes and/or Forb Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, moderate commercial availability	2619	Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed is moderately easy to purchase commercially. Includes materials and shipping.	Acres	$469.81	1	$469.81

Practice: 327 - Conservation Cover

Scenario: #12 - Conservation Cover for Water Quality and Wildlife, Foregone Income - Level 1 (Year 1)

Scenario Description:

Permanent vegetation, including a mix of introduced cool season grasses and legumes, established on cropped wetland area needing permanent vegetative cover that improves water quality and provides wetland wildlife habitat. Typical practice size is 2 acres. Practice applicable on cropland.

Before Situation:

Setting is any prairie pothole. The wetlands must be wholly or partially in cropland. These wetlands are currently cropped, and hydrology has or could be diverted from the wetland by way of tiling, field or road ditching, diking or any other feature that removes wetland hydrology. These wetter or more water saturated portions of cropland fields degrade water quality by nutrients carried through surface inlets. These areas also have the potential to produce a significant amount of moist soil plants which are valuable source of forage and cover for many waterfowl, shorebird and wading bird species. The current system provides little to no wildlife habitat with habitat limiting factors such as quality, quantity and continuity of forage, cover, shelter and space being identified. Drainage could also result in inadequate wildlife water and inadequate habitat.

After Situation:

The 327 Implementation Requirements have been developed for the site and applied. The permanent grass/legume mix vegetation replacing the previously cropped wetland has improved water quality and wetland wildlife habitat.

Feature Measure: Area Planted

Scenario Unit: Acres

Scenario Typical Size: 2.00

Scenario Total Cost: $1,011.76

Scenario Cost/Unit: $505.88

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	4	$59.52
Mechanical weed control, Vegetation termination	957	Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs.	Acres	$27.07	2	$54.14
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	2	$44.54
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$415.54	1	$415.54
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$342.50	1	$342.50
Materials						
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$47.76	2	$95.52

Practice: 327 - Conservation Cover

Scenario: #22 - Monarch Species Mix

Scenario Description:
Establish permanent vegetative cover for pollinator habitat according to state specifications. Typically used for high quality nectar and pollen species. Assumes seed/plugs, equipment and labor for seed bed prep/planting, and weed management during establishment. Used for conventional or organic land on small, intensive areas that are central to specialty crop production. Not typically used for large-scale plantings. This is applicable to both organic and non-organic conditions.

Before Situation:
Old hayfields that are mowed typically in the fall lack milkweed needed for monarchs. Other crops such as corn, soybeans, or cotton are conventionally grown and harvested. The system provides little to no wildlife or pollinator habitat.

After Situation:
The 327 Implementation Requirements have been developed and applied for the site. Land covered with permanent monarch habitat including a mix of milkweed species, native grasses, legumes, and forbs. Plants sown for monarch habitat may also provide cover for beneficial insects and wildlife.

Feature Measure: area planted

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $979.62

Scenario Cost/Unit: $979.62

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	1	$25.36
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	3	$44.64
Mechanical weed control, Vegetation termination	957	Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs.	Acres	$27.07	2	$54.14
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	1	$22.27
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	4	$175.48
Materials						
Native Perennial Grasses, Legumes and/or Forb Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, moderate commercial availability	2619	Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed is moderately easy to purchase commercially. Includes materials and shipping.	Acres	$469.81	1.4	$657.73

Practice: 327 - Conservation Cover

Scenario: #23 - PIA - Grass/Legume Establishment

Scenario Description:

This practice applies on land to be retired from agricultural production and on other lands needing permanent protective cover. This practice typically involves conversion from a clean-tilled (conventional tilled) intensive cropping system to permanent native vegetation species on both organic and non-organic operations. The typical size of the practice is 1 acre. This practice scenario is typically used to reduce soil erosion, reduce soil quality degradation, improve water quality, develop wildlife habitat, and reduce air quality impacts.

Before Situation:

Crops such as corn, soybeans, or vegetables are conventionally grown and harvested. Full width tillage is utilized, weeds controlled by cultivation and/or chemical application. Soil surface residue amounts average 10% or less. Soil erosion exceed allowable tolerance, sediment may be moving offsite into surface water degrading water quality. Soil quality (soil organic matter) declines over time as a result of tillage practices, low residue, and long periods of bare soil. Air quality may be impacted during field operations by the creation of particulates. The system provides little to no wildlife habitat.

After Situation:

The 327 Implementation Requirements have been developed for the site and has been applied. The land is covered with permanent native grass vegetation and has reduced soil erosion, reduced water/sediment runoff, and significant dust emissions are eliminated therefore, air quality is improved. Plants sown for conservation cover may provide cover for beneficial insects and wildlife. This scenario does not apply to plantings for forage production or to critical area plantings.

Feature Measure: Acres Established

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $490.03

Scenario Cost/Unit: $490.03

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	1	$14.88
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acres	$22.61	2	$45.22
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	1	$6.73
Mechanical weed control, Vegetation termination	957	Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs.	Acres	$27.07	1	$27.07
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$12.66	1	$12.66
Native and Introduced Perennial Grasses, Legumes and/or Forbs, Medium Density	2756	A mix of native and introduced perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to high density (41-60 pure live seeds/sq ft). Includes material and shipping.	Acres	$153.79	1	$153.79
Mobilization						
Mobilization, Pacific Island	2679	Mobilization cost of materials for sea or air freight services between islands.	Pound	$0.00	50	$0.00

Practice: 327 - Conservation Cover

Scenario: #24 - Caribbean Area Conservation Cover Introduced Species

Scenario Description:
After applying the practice the land is covered with permanent non-native grass vegetation and has reduced soil erosion, reduced water/sediment runoff, improved wildlife habitat (including pollinator habitat), improved water quality, and improved soil health.

Before Situation:
The land is eroding above the soil loss tolerance, water quality is impaired due to sediment and nutrients, habitat for wildlife is unsuitable, and there is limited pollinator habitat.

After Situation:
The practices is applied per the specification in the 327 Implementation Requirements. Permanent non-native vegetation is established that is suitable to address the planned resource concern(s).

Feature Measure: Acres Planted

Scenario Unit: Acres

Scenario Typical Size: 50.00

Scenario Total Cost: $10,851.00

Scenario Cost/Unit: $217.02

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	50	$744.00
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acres	$22.61	50	$1,130.50
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	50	$1,113.50
Materials						
Nitrogen (N), Ammonium Nitrate	69	Price per pound of N supplied by Ammonium Nitrate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.70	2500	$1,750.00
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.81	2500	$2,025.00
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	2500	$1,700.00
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$47.76	50	$2,388.00

Practice: 327 - Conservation Cover

Scenario: #25 - Caribbean Orchard or Vineyard Alleyways

Scenario Description:

This practice applies on orchards and vineyards needing permanent protective cover in the alleyways between tree and vine rows. The typical size of this practice is 20 acres. This practice typically involves conversion from a clean-tilled (conventional tilled) intensive cropping system to permanent vegetation (scenario includes non-native grass and legume mix). This practice scenario is typically used to reduce soil erosion, reduce soil quality degradation, improve water quality, enhance wildlife and/or pollinator habitat, manage plant pests, and reduce air quality impacts.

Before Situation:

Orchard or vineyard with bare soil between vine/tree rows. Bare soil is exposed to wind erosion and/or intense rainfall during the fall, winter, and early spring. Over the winter sediment/nutrient runoff from orchards/vineyards increases.

After Situation:

The 327 Implementation Requirements have been developed for the site and has been applied. Orchard or Vineyard area between vine/tree rows are planted with permanent introduced grass/legume mix. Area covered has reduced soil erosion, improved soil quality, improved water quality, and enhanced wildlife and/or pollinator habitat.

Feature Measure: Acres Planted

Scenario Unit: Acres

Scenario Typical Size: 20.00

Scenario Total Cost: $4,340.40

Scenario Cost/Unit: $217.02

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	20	$297.60
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acres	$22.61	20	$452.20
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	20	$445.40
Materials						
Nitrogen (N), Ammonium Nitrate	69	Price per pound of N supplied by Ammonium Nitrate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.70	1000	$700.00
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.81	1000	$810.00
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	1000	$680.00
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$47.76	20	$955.20

Practice: 327 - Conservation Cover

Scenario: #26 - Pacific Islands Conservation Cover

Scenario Description:

This practice applies on land to be retired from agricultural production and on other lands needing permanent protective cover. This practice typically involves conversion from a clean-tilled (conventional tilled) intensive cropping system to permanent native vegetation species on both organic and non-organic operations. The typical size of the practice is 40 acres. This practice scenario is typically used to reduce soil erosion, reduce soil quality degradation, improve water quality, develop wildlife habitat, and reduce air quality impacts.

Before Situation:

Crops such as corn, soybeans, vegetables, or cotton are conventionally grown and harvested. Full width tillage is utilized, weeds controlled by cultivation and/or chemical application. Soil surface residue amounts average 10% or less. Soil erosion exceed allowable tolerance, sediment may be moving offsite into surface water degrading water quality. Soil quality (soil organic matter) declines over time as a result of tillage practices, low residue, and long periods of bare soil. Air quality may be impacted during field operations by the creation of particulates. The system provides little to no wildlife habitat.

After Situation:

The 327 Implementation Requirements have been developed for the site and has been applied. The land is covered with permanent native grass vegetation and has reduced soil erosion, reduced water/sediment runoff, and significant dust emissions are eliminated therefore, air quality is improved. Plants sown for conservation cover may provide cover for beneficial insects and wildlife. This scenario does not apply to plantings for forage production or to critical area plantings.

Feature Measure: Acres Planted

Scenario Unit: Acres

Scenario Typical Size: 40.00

Scenario Total Cost: $7,789.20

Scenario Cost/Unit: $194.73

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	40	$595.20
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acres	$22.61	40	$904.40
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	40	$890.80
Materials						
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$134.97	40	$5,398.80

Practice: 327 - Conservation Cover

Scenario: #42 - Introduced with Forgone Income

Scenario Description:

This practice applies on organically managed land needing permanent protective cover. This practice typically involves conversion from an intensive organic cropping system to permanent non-native vegetation (scenario includes non-native grass/legume mix). The typical size of the practice is 20 acres. This practice scenario is typically used to reduce soil erosion, reduce soil quality degradation, improve water quality, develop wildlife habitat, and reduce air quality impacts.

Before Situation:

Crops such as vegetables and small fruit crops are organically grown and harvested. Full width tillage is utilized, weeds controlled mainly by cultivation. Soil surface residue amounts average 10% or less. Erosion exceeds tolerable rates and sediment may be moving offsite into surface water degrading water quality. Soil quality (soil organic matter) declines over time as a result of tillage practices, low residue, and long periods of bare soil. Air quality may be impacted during field operations by the creation of particulates. The system provides little to no wildlife habitat.

After Situation:

The 327 Implementation Requirements have been developed for the site and has been applied. Organically managed land covered with permanent non- native grass/legume mix vegetation has reduced soil erosion, reduced water/sediment runoff, and improved air quality due to the elimination of dust emissions. . Plants sown for conservation cover may provide cover for beneficial insects and wildlife. This scenario does not apply to plantings for forage production or to critical area plantings.

Feature Measure: Area planted

Scenario Unit: Acres

Scenario Typical Size: 50.00

Scenario Total Cost: $27,298.50

Scenario Cost/Unit: $545.97

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	150	$2,232.00
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.61	50	$380.50
Mechanical weed control, Vegetation termination	957	Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs.	Acres	$27.07	50	$1,353.50
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	50	$1,113.50
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$415.54	25	$10,388.50
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$342.50	25	$8,562.50
Materials						
Nitrogen, Organic	266	ORGANIC Nitrogen	Pound	$0.28	2500	$700.00
Phosphorus, Organic	267	ORGANIC Phosphorus	Pound	$0.09	2000	$180.00
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$47.76	50	$2,388.00

Practice: 327 - Conservation Cover

Scenario: #43 - Native Species with Forgone Income

Scenario Description:

This practice applies on conventional or organically managed land needing permanent protective cover. This practice typically involves conversion from an intensive cropping system to permanent native vegetation (scenario includes native grass/legume mix). The typical size of the practice is 50 acres. This practice scenario is typically used to reduce soil erosion, reduce soil quality degradation, improve water quality, develop wildlife habitat, and reduce air quality impacts. Applies to conventional or organic systems.

Before Situation:

Crops such as vegetables and small fruit crops may be conventionally or organically grown and harvested. Full width tillage is utilized, weeds controlled mainly by cultivation. Soil surface residue amounts average 10% or less. Soil erosion exceeds tolerable rates and sediment may be moving offsite into surface water degrading water quality. Soil quality (soil organic matter) declines over time as a result of tillage practices, low residue, and long periods of bare soil. Air quality may be impacted during field operations by the creation of particulates. The system provides little to no wildlife habitat.

After Situation:

The 327 Implementation Requirements have been developed for the site and applied. Managed land covered with permanent native grass/legume mix vegetation has reduced soil erosion, reduced water/sediment runoff, and improved air quality due to the elimination of dust emissions. Plants sown for conservation cover may provide cover for beneficial insects and wildlife. This scenario does not apply to plantings for forage production or to critical area plantings.

Feature Measure: Area planted

Scenario Unit: Acres

Scenario Typical Size: 50.00

Scenario Total Cost: $31,752.00

Scenario Cost/Unit: $635.04

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	150	$2,232.00
Mechanical weed control, Vegetation termination	957	Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs.	Acres	$27.07	100	$2,707.00
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	50	$1,113.50
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$415.54	25	$10,388.50
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$342.50	25	$8,562.50
Materials						
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$134.97	50	$6,748.50

Practice: 327 - Conservation Cover

Scenario: #44 - Pollinator Species with Forgone Income

Scenario Description:

Permanent vegetation, including a mix of native grasses, legumes, and forbs (mix may also include non-native species), established on land needing permanent vegetative cover that provides habitat for pollinators. Typical practice size is variable depending on site; this scenario uses 1 ac as the typical size. In addition to providing pollinator habitat, this practice scenario may also reduce sheet and rill erosion, improve soil quality, improve water quality, and improve air quality. The practice may also provide wildlife habitat. Practice applicable on cropland, odd areas, corners, etc. Applies to conventional or organic systems.

Before Situation:

Crops such as vegetables and small fruit crops may be conventionally or organically grown and harvested. Full width tillage is utilized, weeds controlled mainly by cultivation. Soil surface residue amounts average 10% or less. Soil erosion exceeds tolerable rates and sediment may be moving offsite into surface water degrading water quality. Soil quality (soil organic matter) declines over time as a result of tillage practices, low residue, and long periods of bare soil. Air quality may be impacted during field operations by the creation of particulates. The system provides little to no wildlife or pollinator habitat.

After Situation:

The 327 Implementation Requirements have been developed for the site and applied. Managed land covered with permanent pollinator habitat including a mix of native grasses, legumes, and forbs (mix may also include non-native species). This practice may also reduce soil erosion, reduce water/sediment runoff, and improve air quality due to the elimination of dust emissions. Plants sown for pollinator habitat may also provide cover for beneficial insects and wildlife. This scenario does not apply to critical area plantings.

Feature Measure: Area planted

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $969.88

Scenario Cost/Unit: $969.88

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	3	$44.64
Mechanical weed control, Vegetation termination	957	Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs.	Acres	$27.07	2	$54.14
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	1	$22.27
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$415.54	0.5	$207.77
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$342.50	0.5	$171.25
Materials						
Native Perennial Grasses, Legumes and/or Forb Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, moderate commercial availability	2619	Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed is moderately easy to purchase commercially. Includes materials and shipping.	Acres	$469.81	1	$469.81

Practice: 327 - Conservation Cover

Scenario: #58 - Beneficial Insect Habitat, FI

Scenario Description:

Permanent vegetation, including mix of native grasses, legume, forbs (mix may also include non-native species), established on any land needing permanent vegetative cover that provides habitat for beneficial insects. Typical practice size is variable depending on site, this scenario uses 1 ac as the typical size. In addition to providing beneficial insect habitat, this practice scenario may also reduce sheet and rill erosion, improve soil quality, improve water quality, and improve air quality. The practice may also provide wildlife habitat. Practice applicable on cropland, odd areas, corners, etc.

Before Situation:

Crops such as corn, soybeans, or wheat are conventionally grown and harvested. Full width tillage is utilized, weeds controlled by cultivation and/or chemical application. Soil surface residue amounts average 10% or less. Soil erosion occurs with visible rills present, sediment may be moving offsite into surface water degrading water quality. Soil quality (soil organic matter) declines over time as a result of tillage practices, low residue, and long periods of bare soil. Air quality may be impacted during field operations by the creation of particulates. The system provides little to no wildlife or pollinator habitat.

After Situation:

Land covered with permanent beneficial insect habitat including a mix of native grasses, legume, forbs (mix may also include non-native species). This practice may also have reduced soil erosion, reduced water/sediment runoff, and significant dust emissions are eliminated therefore, air quality is improved. Plants sown for beneficial insect habitat may also provide cover for pollinators and wildlife. This scenario does not apply to critical area plantings. Loss of income as a result of perennial vegetation, replacing cash crops.

Feature Measure: Area planted

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $923.29

Scenario Cost/Unit: $923.29

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	1	$14.88
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	1	$6.73
Mechanical weed control, Vegetation termination	957	Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs.	Acres	$27.07	2	$54.14
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	1	$22.27
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$415.54	0.33	$137.13
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$342.50	0.33	$113.03
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acres	$272.50	0.34	$92.65
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$12.66	1	$12.66
Native Perennial Grasses, Legumes and/or Forb Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, moderate commercial availability	2619	Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed is moderately easy to purchase commercially. Includes materials and shipping.	Acres	$469.81	1	$469.81

Practice: 327 - Conservation Cover

Scenario: #91 - Pollinator Mix-Small Footprint

Scenario Description:

Permanent vegetation, including a mix of grasses, legumes and forbs established on any land needing permanent vegetative cover that provides habitat, cover, and food for pollinators. Typical size varies depending on the site feasibility for length and width. Urban sites typical size is 2000 square feet (20x100 ft). This scenario included mechanical site preparation. This practice scenario may also reduce wind and water erosion, improve soil quality, reduce water quality degradation and reduce air emissions of particulate matter or greenhouse gases. Applies to conventional and organic systems. This scenario does not applied to areas needing Critical Area Planting.

Before Situation:

Crop rotation include specialty crops such as vegetable and fruit/berry production that benefit from pollinator activity. Urban agricultural sites do not provide for pollinator habitat at this time. Planting operations include mechanical removal of weeds. Land adjacent to the planting beds is not managed for resource concerns.

After Situation:

The 327 implementation requirements have been developed for the site and applied. Land is in permanent vegetative cover reducing erosion and sediment delivery to water. Pollinator habitat has successfully established providing habitat and cover for pollinators and beneficial insects.

Feature Measure: Area of conservation Cover Installe

Scenario Unit: 1,000 Square Foot

Scenario Typical Size: 2.00

Scenario Total Cost: $285.59

Scenario Cost/Unit: $142.80

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	1	$14.88
Mechanical weed control, Vegetation termination	957	Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs.	Acres	$27.07	0.5	$13.54
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	1	$22.27
Materials						
Native Perennial Grasses, Legumes and/or Forb Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, moderate commercial availability	2619	Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed is moderately easy to purchase commercially. Includes materials and shipping.	Acres	$469.81	0.5	$234.91

Practice: 328 - Conservation Crop Rotation

Scenario: #1 - Basic Rotation Organic and Non-Organic

Scenario Description:

In this region this practice may be part of a conservation management system on both organic and non-organic operations to: 1) Reduce sheet, rill and wind erosion, 2) Maintain or increase soil health and organic matter content, 3) Reduce water quality degradation due to excess nutrients, 4) Improve soil moisture efficiency, 5) Reduce the concentration of salts and other chemicals from saline seeps, 6) Reduce plant pest pressures, 7) Provide feed and forage for domestic livestock, and 8) Provide food and cover habitat for wildlife, including pollinator forage, and nesting. This practice payment is provided to the producer for the time needed to plan and implement the logistics of changing the rotation to effectively implement a conservation crop rotation on a typical 200 acre cropland farm. No foregone income. Cost represents typical situations for conventional and organic producers.

Before Situation:

The rotation consists primarily of low residue producing row crops. Fields range from nearly flat to C and D slopes. Erosion, soil quality, and pest management are the primary concerns.

After Situation:

A rotation is established that provides additional high residue and/or perennial crops that may treat one or more of the following purposes: reduce sheet, rill and wind erosion, maintain or increase soil health and organic matter content, reduce water quality degradation due to excess nutrients, improve soil moisture efficiency, reduce the concentration of salts and other chemicals from saline seeps, reduce plant pest pressures, provide feed and forage for domestic livestock, or provide food and cover habitat for wildlife, including pollinator forage, and nesting.

Feature Measure: Area planted

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $1,458.00

Scenario Cost/Unit: $14.58

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	30	$1,458.00

Practice: 328 - Conservation Crop Rotation

Scenario: #5 - Specialty Crops Organic and Non-Organic

Scenario Description:

In this region a rotation of organic or non-organic specialty crops (fruits and vegetable) are produced as part of a conservation management system to treat one or more of the following resource concerns: 1) Reduce sheet, rill and wind erosion, 2) Maintain or increase soil health and organic matter content, 3) Reduce water quality degradation due to excess nutrients, 4) Improve soil moisture efficiency, 5) Reduce the concentration of salts and other chemicals from saline seeps, 6) Reduce plant pest pressures, 7) Provide feed and forage for domestic livestock, and 8) Provide food and cover habitat for wildlife, including pollinator forage, and nesting. This practice payment is provided to acquire the technical knowledge and skills necessary to effectively implement a conservation crop rotation on a typical 50 acre specialty crop farm. No foregone income. Cost represents typical situations for organic and non-organic producers.

Before Situation:

This rotation consisted of growing specialty crops. Fields range from nearly flat to B and C slopes. Erosion, soil quality, and pest management are the primary concerns.

After Situation:

The rotation established adds higher residue crop(s) to the rotation that will treat one or more of the following resource concerns on organic and non- organic farms: 1) Reduce sheet, rill and wind erosion, 2) Maintain or increase soil health and organic matter content, 3) Reduce water quality degradation due to excess nutrients, 4) Improve soil moisture efficiency, 5) Reduce the concentration of salts and other chemicals from saline seeps, 6) Reduce plant pest pressures, 7) Provide feed and forage for domestic livestock, and 8) Provide food and cover habitat for wildlife, including pollinator forage, and nesting.

Feature Measure: Area planted

Scenario Unit: Acres

Scenario Typical Size: 50.00

Scenario Total Cost: $1,944.00

Scenario Cost/Unit: $38.88

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	40	$1,944.00

Practice: 328 - Conservation Crop Rotation

Scenario: #63 - Rice Residue Management for Waterfowl

Scenario Description:

The resource concern is food and cover for waterfowl where rice is grown in the waterfowl flyway zones. This scenario manages the rice residue after rice harvest to enhance the food and cover for waterfowl. The payment for the practice scenario is based on the cost to roll alternate strips of rice residue flat while leaving the alternate strips of rice residue left undisturbed after rice harvest.

Before Situation:

The typical situation after rice harvest is tilling the soil to bury or mix the rice residue remaining after harvest into the soil. This results in virtually no food or cover for the waterfowl that traverse the waterfowl flyways.

After Situation:

The rice residue after rice harvest will remain standing except for the alternate strip of the rice residue rolled almost flat to provide alternate strip of both cover and food. The rice residue will be left in this condition until the following spring.

Feature Measure: Residue Cover

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $509.00

Scenario Cost/Unit: $5.09

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$10.18	50	$509.00

Practice: 328 - Conservation Crop Rotation

Scenario: #72 - Irrigated to Dryland Rotation Organic and Non-Organic

Scenario Description:

In this region this practice may be part of a conservation management system to primarily convert from an irrigated cropping system to dryland farming. In addition to improving water use efficiency the rotation may: 1) Reduce sheet, rill and wind erosion, 2) Maintain or increase soil health and organic matter content, 3) Reduce water quality degradation due to excess nutrients, 4) Improve soil moisture efficiency, 5) Reduce the concentration of salts and other chemicals from saline seeps, 6) Reduce plant pest pressures, 7) Provide feed and forage for domestic livestock, and 8) Provide food and cover habitat for wildlife, including pollinator forage, and nesting. This practice payment is provided to acquire the technical knowledge and skills necessary to effectively implement a conservation crop rotation on a typical 200 acre cropland farm. There is foregone income involved with this conversion from irrigated to dryland farming due to lower yields and net return. Cost represents typical situations for conventional (non-organic) producers converting from irrigated cropping to dryland farming.

Before Situation:

This rotation consisted of growing row crop grains that received a significant (more than half) of the required water via irrigation. The water demands are impacting the area's water availability. Erosion, soil condition, and future water availability are the major concerns.

After Situation:

The dryland rotation, using the same crops or a rotation that grows crops over different periods, will be part of a management system capable of utilizing available rainfall and soil moisture more efficiently and controlling wind and water erosion. Corn yields will be expected to be reduced from 150 to 80 bu/acre.

Feature Measure: Area planted

Scenario Unit: Acres

Scenario Typical Size: 200.00

Scenario Total Cost: $29,188.00

Scenario Cost/Unit: $145.94

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$415.54	-200	($83,108.00)
FI, Corn Irrigated	1960	Irrigated Corn is Primary Crop	Acres	$554.19	200	$110,838.00
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	30	$1,458.00

Practice: 328 - Conservation Crop Rotation

Scenario: #85 - Specialty Crop Rotations-Small Scale

Scenario Description:

Scenario applies to Urban sites less than a 1/2 acre with a rotation of organic or non-organic specialty crops (fruits and vegetable) are produced as part of a conservation management system to treat one or more of the following resource concerns: 1) Reduce sheet, rill and wind erosion, 2) Maintain or increase soil health and organic matter content, 3) Reduce water quality degradation due to excess nutrients, 4) Improve soil moisture efficiency, 5) Reduce the concentration of salts and other chemicals from saline seeps, 6) Reduce plant pest pressures, 7) Provide feed and forage for domestic livestock, and 8) Provide food and cover habitat for wildlife, including pollinator forage, and nesting. This practice payment is provided to acquire the technical knowledge and skills necessary to effectively implement a conservation crop rotation on a typical urban specialty crop farm. Cost represents typical situations for organic and non-organic producers.

Before Situation:

This rotation consisted of growing specialty crops. Fields range from nearly flat to B and C slopes. Erosion, soil quality, and pest management are the primary concern. Removal of residue from the planted area is common leaving bare soil.

After Situation:

The rotation established adds diversity of plant material organic matter, higher residue amounts that will treat one or more of the following resource concerns on organic and non- organic farms: reduce sheet, rill and wind erosion, maintain or increase soil health and organic matter content, improve soil moisture efficiency or reduce plant pest pressure.

Feature Measure: area planned

Scenario Unit: 1,000 Square Foot

Scenario Typical Size: 15.00

Scenario Total Cost: $567.05

Scenario Cost/Unit: $37.80

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Mechanical weed control, Vegetation termination	957	Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs.	Acres	$27.07	0.34	$9.20
Seeding Operation, No Till/Strip Till Planter	1230	No Till/Strip Till row planters for seeding. Includes all costs for equipment, power unit, and labor.	Acres	$23.11	0.34	$7.86
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	9	$258.39
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	6	$291.60

Practice: 328 - Conservation Crop Rotation

Scenario: #108 - Short term perennial

Scenario Description:

This practice payment is provided to the producer for the time needed to plan and implement the logistics of adding a short term perennial such as alfalfa or intermediate wheatgrass into crop rotation to effectively implement a conservation crop rotation on a cropland farm by adding a perennial crop for either forage, grain, or dual purpose use to their cropping system. The crop is intended to be a harvested and must be grown for at least 3 years after planting. No foregone income. Cost represents typical situations for conventional and organic producers. In this region this practice may be part of a conservation management system on both organic and non-organic operations that: (1) Reduces erosion; (2) Improves soil fertility and tilth; (3) Interrupts pest cycles; and (4) Builds soil organic matter. In applicable areas, reduces depletion of soil moisture or otherwise reduces the need for irrigation.

Before Situation:

Annual grain crops being grown. Perennials have not been grown on field within the past 3 years. Fields range from nearly flat to C and D slopes. Erosion, soil quality, and pest management are the primary concerns.

After Situation:

A rotation is established with a perennial crop that may treat one or more of the following purposes: reduce sheet, rill and wind erosion, maintain or increase soil health and organic matter content, reduce water quality degradation due to excess nutrients, improve soil moisture efficiency, reduce the concentration of salts and other chemicals from saline seeps, reduce plant pest pressures, provide feed and forage for domestic livestock, or provide food and cover habitat for wildlife, including pollinator forage, and nesting

Feature Measure: Treated acres

Scenario Unit: Acres

Scenario Typical Size: 40.00

Scenario Total Cost: $2,570.19

Scenario Cost/Unit: $64.25

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.39	1	$116.39
Equipment Installation						
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	20	$445.40
Seeding Operation, No Till/Strip Till Planter	1230	No Till/Strip Till row planters for seeding. Includes all costs for equipment, power unit, and labor.	Acres	$23.11	20	$462.20
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	20	$574.20
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	20	$972.00

Practice: 328 - Conservation Crop Rotation

Scenario: #109 - Small grain

Scenario Description:

This practice payment is provided to the producer for the time needed to plan and implement the logistics of adding a winter annual or spring planted small grain into crop rotation to effectively implement a conservation crop rotation on a cropland farm by adding a small grain crop for either forage or grain to their cropping system. The crop is intended to be a harvested. No foregone income. Cost represents typical situations for conventional and organic producers. In this region this practice may be part of a conservation management system on both organic and non-organic operations that: (1) Reduces erosion; (2) Improves soil fertility and tilth; (3) Interrupts pest cycles; and (4) Builds soil organic matter.

Before Situation:

Small grain has not been grown on field within the past 3 years. Growth of a small grain included as a cover crop on field does not restrict implementation. Fields range from nearly flat to C and D slopes. Erosion, soil quality, and pest management are the primary concerns.

After Situation:

A rotation is established with a small grain that may treat one or more of the following purposes: reduce sheet, rill and wind erosion, maintain or increase soil health and organic matter content, reduce water quality degradation due to excess nutrients, improve soil moisture efficiency, reduce plant pest pressures, provide feed and forage for domestic livestock, and provide openings for other conservation practice implementation. This scenario would allow for a earlier harvest window compared to other row crops potentially allowing for better implementation of cover crops.

Feature Measure: Treated acres

Scenario Unit: Acres

Scenario Typical Size: 40.00

Scenario Total Cost: $1,841.19

Scenario Cost/Unit: $46.03

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.39	1	$116.39
Equipment Installation						
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	20	$445.40
Seeding Operation, No Till/Strip Till Planter	1230	No Till/Strip Till row planters for seeding. Includes all costs for equipment, power unit, and labor.	Acres	$23.11	20	$462.20
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	20	$574.20
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	5	$243.00

Practice: 329 - Residue and Tillage Management, No Till

Scenario: #1 - No-Till/Strip-Till

Scenario Description:

This practice typically involves conversion from a clean-tilled (conventional tilled) system to no-till or strip-till system on 100 acres of cropland. This involves managing the amount, orientation and distribution of crop and other plant residue on the soil surface year round while limiting soil-disturbing activities used to establish and harvest crops. The practice is used to reduce sheet and rill erosion, reduce wind erosion, improve soil quality, reduce CO2 losses from the soil, reduce energy use, increase plant available moisture and provide food and escape cover for wildlife. The no-till/strip-till system includes non-tillage types of weed control and may also include a period of no till fallow. System is applicable in both irrigated and non-irrigated fields of organic and non-organic operations.

Before Situation:

Row crops or small grains are grown and harvested. Full width tillage is performed prior to planting and weed control during crop production is typically cultivation and chemical application. Fields are disked immediately following harvest, with additional operations in some fields to facilitate drainage, seedbed preparation or additional weed control. Residue amounts after tillage operations average 10% or less, resulting in bare soil being exposed to wind erosion and/or intense rainfall. Any crop residue that is present degrades and sediment/nutrient runoff from fields increases during rainfall events. Sheet and rill erosion occurs with visible rills by spring. Soil health (soil organic matter) declines over time as a result of tillage practices, low residue, and long periods of bare soil. This system will typically have a negative Soil Conditioning Index (SCI) and a high Soil Tillage Intensity Rating (STIR).

After Situation:

The Implementation Requirements for 329 Residue Management, No Till is prepared and installed. Managing crop residue on the surface of a field (typical 100 acre) year around according to the 329 practice plan while limiting soil disturbing activities to those which place nutrients, and plant crops that meet the minimum criteria in the 329 practice standard. All crops are seeded/planted with a no-till drill or no-till/strip-till planter, which minimizes soil disturbance while establishing good seed-soil contact. All residues are to be maintained on the soil surface in a uniform distribution over the entire field and not burned or removed. Crop residues provide soil surface cover throughout the year. Runoff and erosion are reduced and no rills are visible on the soil surface. Wind erosion is reduced by standing residues and surface cover. Over time, soil health is improved due to the additional biomass (crop residues), ground cover, and soil infiltration. Crop residues and/or cover crop residues left on the soil surface may maximize weed control by increasing allelopathic and mulching effect, and provides cover for wildlife. The practice would require reducing soil disturbance and erosion and increasing biomass returned to the soil in sufficient amounts to achieve increased SCI and decreased STIR.

Feature Measure: Area planted

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $2,227.00

Scenario Cost/Unit: $22.27

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	100	$2,227.00

Practice: 329 - Residue and Tillage Management, No Till

Scenario: #3 - No Till Adaptive Management

Scenario Description:

The practice scenario is for the implementation of no till in small replicated plots to allow the producer to learn how to manage no till on their operation. Scenario includes implementing replicated strip trials on a field plot to evaluate, identify and implement a particular no till management strategy (e.g., no till vs conventional till, drill vs planter, strip till vs no till, residue row cleaners, vs no row cleaners, etc.) This will be done by following the Agronomy Technical Note 10 - Adaptive Management.

Before Situation:

Row crops or small grains are grown and harvested. Full width tillage is performed prior to planting and weed control during crop production is typically cultivation and chemical application. Fields are disked immediately following harvest, with additional operations in some fields to facilitate drainage or additional weed control. Residue amounts after tillage operations average 10% or less, resulting in bare soil being exposed to wind erosion and/or intense rainfall. Any crop residue that is present degrades and sediment/nutrient runoff from fields increases during rainfall events. Sheet and rill erosion exceeds soil loss tolerances. Soil health (soil organic matter) declines over time as a result of tillage practices, low residue, and long periods of bare soil. This system will typically have a negative Soil Conditioning Index (SCI) and a high Soil Tillage Intensity Rating (STIR). The producer is considering using no till technology, but is unsure how to manage on their operation or needs to improve the management of no till to be successful.

After Situation:

Implementation Requirements are prepared and an Adaptive Management Plan for the plots is developed and implemented. Installation of this scenario will result in establishment of no till replicated plots to compare to different management strategies for no till and other residue management strategies following the guidance in the Agronomy Technical Note 10 - Adaptive Management Process. Implementation involves establishing the replicated plots to evaluate one or more no till management strategies. The plot will consist of at least 4 replicated plots designed, laid out, managed and evaluated with the assistance of a consultant knowledgeable in no till management. Results are used to make no till management decisions to address erosion, soil health, and water quality issues. Yields will be measured and statistically summarized following the procedures in Agronomy Technical Note 10 - Adaptive Management. The yields for each plot will be adjusted to the appropriate moisture content. This would be repeated for 3 years.

Feature Measure: Based on 15 acre plots

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $3,717.75

Scenario Cost/Unit: $3,717.75

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	7.5	$167.03
Seeding Operation, No Till/Strip Till Planter	1230	No Till/Strip Till row planters for seeding. Includes all costs for equipment, power unit, and labor.	Acres	$23.11	7.5	$173.33
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	40	$1,148.40
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	20	$2,229.00

Practice: 329 - Residue and Tillage Management, No Till

Scenario: #15 - No-Till/Strip-Till with Herbicide and No Cover Crop

Scenario Description:

This practice typically involves conversion from a clean-tilled (conventional tilled) system to no-till or strip-till system on 100 acres of cropland. This involves managing the amount, orientation and distribution of crop and other plant residue on the soil surface year round while limiting soil-disturbing activities used to establish and harvest crops. The practice is used to reduce sheet and rill erosion, reduce wind erosion, improve soil quality, reduce CO2 losses from the soil, reduce energy use, increase plant available moisture and provide food and escape cover for wildlife. The no-till/strip-till system includes non-tillage types of weed control, which may include the use of herbicides and may also include a period of no till fallow. System is applicable in both irrigated and non-irrigated fields organic and non-organic operations. Herbicide treatment is to burndown weeds in the residue prior to planting the crop. This treatment is only when a cover crop is not present. Follow the Cover Crop (340) practice for herbicide burn down.

Before Situation:

Row crops or small grains are grown and harvested. Full width tillage is performed prior to planting and weed control during crop production is typically cultivation and chemical application. Fields are disked immediately following harvest, with additional operations in some fields to facilitate drainage, seedbed preparation or additional weed control. Residue amounts after tillage operations average 10% or less, resulting in bare soil being exposed to wind erosion and/or intense rainfall. Any crop residue that is present degrades and sediment/nutrient runoff from fields increases during rainfall events. Sheet and rill erosion occurs with visible rills by spring. Soil health (soil organic matter) declines over time as a result of tillage practices, low residue, and long periods of bare soil. This system will typically have a negative Soil Conditioning Index (SCI) and a high Soil Tillage Intensity Rating (STIR).

After Situation:

The Implementation Requirements for 329 Residue Management, No Till/Strip Till is prepared and installed. Managing crop residue on the surface of a field (typical 100 acre) year around according to the 329 practice plan while limiting soil disturbing activities to those which place nutrients, and plant crops that meet the minimum criteria in the 329 practice standard. All crops are seeded/planted with a no-till drill or no-till/strip-till planter, which minimizes soil disturbance while establishing good seed-soil contact. All residues are to be maintained on the soil surface in a uniform distribution over the entire field and not burned or removed. Crop residues provide soil surface cover throughout the year. Runoff and erosion are reduced and no rills are visible on the soil surface. Wind erosion is reduced by standing residues and surface cover. Over time, soil health is improved due to the additional biomass (crop residues), ground cover, and soil infiltration. Crop residues and/or cover crop residues left on the soil surface may maximize weed control by increasing allelopathic and mulching effect, and provides cover for wildlife. The practice would require reducing soil disturbance and erosion and increasing biomass returned to the soil in sufficient amounts to achieve increased SCI and decreased STIR.

Feature Measure: Area planted

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $4,208.00

Scenario Cost/Unit: $42.08

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	100	$673.00
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	50	$1,113.50
Seeding Operation, No Till/Strip Till Planter	1230	No Till/Strip Till row planters for seeding. Includes all costs for equipment, power unit, and labor.	Acres	$23.11	50	$1,155.50
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$12.66	100	$1,266.00

Practice: 329 - Residue and Tillage Management, No Till

Scenario: #22 - Small Scale No Till

Scenario Description:

Scenario applies to Urban sites less than a 1/2 acre with a rotation of organic or non-organic specialty crops (fruits and vegetable) are produced as part of a conservation management system to treat one or more of the following resource concerns: 1) Reduce sheet, rill and wind erosion, 2) Maintain or increase soil health and organic matter content, 3) Improve soil moisture efficiency, 4) Reduce plant pest pressures. This practice payment is provided to effectively implement no-till or strip-till management on a typical urban specialty crop farm. Cost represents typical situations for organic and non-organic producers.

Before Situation:

This rotation consisted of growing specialty crops. Fields range from nearly flat to B and C slopes. Erosion, soil quality, and pest management are the primary concern. Removal of residue from the planted area is common leaving bare soil-residue amounts average 10% or less. Full width tillage is performed prior to planting . Weed control typically cultivation.

After Situation:

The implementation requirements are written following CPS 329 Residue and Tillage Management to will treat one or more of the following resource concerns on organic and non- organic farms: reduce sheet, rill and wind erosion, maintain or increase soil health and organic matter content, improve soil moisture efficiency or reduce plant pest pressure. Soil disturbance is minimized with no-till drill or planter use. May include single slot opener and seedling or plugs follow. When pest management requires the removal of crop residue then planting beds are covered with cover crop using the 340 Cover Crop conservation practice. Runoff and erosion are reduced below T. No observed rills. Wind erosion reduced by maintaining surface cover. They system meets the soil condition index and STIR requirements.

Feature Measure: area planted

Scenario Unit: 1,000 Square Foot

Scenario Typical Size: 15.00

Scenario Total Cost: $643.83

Scenario Cost/Unit: $42.92

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	0.17	$3.79
Seeding Operation, No Till/Strip Till Planter	1230	No Till/Strip Till row planters for seeding. Includes all costs for equipment, power unit, and labor.	Acres	$23.11	0.17	$3.93
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	12	$344.52
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	6	$291.60

Practice: 329 - Residue and Tillage Management, No Till

Scenario: #40 - No-Till / Strip - Till Complex

Scenario Description:

This practice typically involves conversion from a clean-tilled (conventional tilled) system to no-till or strip-till system on 100 acres of cropland. This involves managing the amount, orientation and distribution of crop and other plant residue on the soil surface year round while limiting soil-disturbing activities used to establish and harvest crops. The practice is used to reduce sheet and rill erosion, reduce wind erosion, improve soil quality, reduce CO2 losses from the soil, reduce energy use, increase plantavailable moisture and provide food and escape cover for wildlife. The no-till/strip-till system includes non-tillage types of weed control and may also include a period of no till fallow. System is applicable in both irrigated and non-irrigated fields of organic and non-organic operations.

Before Situation:

Row crops or small grains are grown and harvested. Full width tillage is performed prior to planting and weed control during crop production is typically cultivation and chemical application. Fields are disked immediately following harvest, with additional operations in some fields to facilitate drainage, seedbed preparation or additional weed control. Residue amounts after tillage operations average 10% or less, resulting in bare soil being exposed to wind erosion and/or intense rainfall. Any crop residue that is present degrades and sediment/nutrient runoff from fields increases during rainfall events. Sheet and rill erosion occurs with visible rills by spring. Soil health (soil organic matter) declines over time as a result of tillage practices, low residue, and long periods of bare soil. This system will typically have a negative Soil Conditioning Index (SCI) and a high Soil Tillage Intensity Rating (STIR).

After Situation:

The Implementation Requirements for 329 Residue Management, No Till is prepared and installed. Attendance at conferences to acquire knowledge related to converting to a no-till / strip-till system. Managing crop residue on the surface of a field (typical 100 acre) year around according to the 329 practice plan while limiting soil disturbing activities to those which place nutrients, and plant crops that meet the minimum criteria in the 329 practice standard. All crops are seeded/planted with a no-till drill or no-till/strip-till planter, which minimizes soil disturbance while establishing good seed-soil contact. All residues are to be maintained on the soil surface in a uniform distribution over the entire field and not burned or removed. Crop residues provide soil surface cover throughout the year. Runoff and erosion are reduced, and no rills are visible on the soil surface. Wind erosion is reduced by standing residues and surface cover. Over time, soil health is improved due to the additional biomass (crop residues), ground cover, and soil infiltration. Crop residues and/or cover crop residues left on the soil surface may maximize weed control by increasing allelopathic and mulching effect and provides cover for wildlife. The practice would require reducing soil disturbance and erosion and increasing biomass returned to the soil in sufficient amounts to achieve increased SCI and decreased STIR.

Feature Measure: Area Planted

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $3,668.18

Scenario Cost/Unit: $36.68

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.39	2	$232.78
Equipment Installation						
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	50	$1,113.50
Seeding Operation, No Till/Strip Till Planter	1230	No Till/Strip Till row planters for seeding. Includes all costs for equipment, power unit, and labor.	Acres	$23.11	50	$1,155.50
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	24	$1,166.40

Practice: 330 - Contour Farming

Scenario: #1 - Contour Farming

Scenario Description:

This scenario meets the specifications of the NRCS Contour Farming Standard. This scenario applies to fields greater than 5 acres. Payment reflects the extra labor and initial supervision costs in laying out and implementing contour farming. Annual erosion rates for the rotation exceeds tolerance levels. Excessive runoff leads to sedimentation of waterways

Before Situation:

The typical field size in this geographical region for this scenario is 30 acres. The field slope averages 6% while the slope length averages 160 feet. All farming operations on this cropland field including disking, bedding, planting, and cultivation are performed generally up and down the slope. Annual erosion rates for the rotation exceeds tolerance levels. Excessive runoff leads to sedimentation of waterways.

After Situation:

Implementation Requirements are prepared and implemented according to 330 Contour Farming. This practice is installed on the entire field. A survey is completed by trained and certified Federal, State, local personnel or consultant to determine and 'stake' contour row arrangement. Permanent row markers are established to ensure that this practice is maintained for the life of this practice. All field operations including disking, bedding, planting, and cultivation are performed on the contour which is near perpendicular to the field slope. The farm manager is initially on site to ensure that equipment operators are properly following contour methods. Soil erosion rates are reduced by nearly half and may be below tolerance depending on the rotation. Likewise, sedimentation has been significantly reduced.

Feature Measure: acre

Scenario Unit: Acres

Scenario Typical Size: 30.00

Scenario Total Cost: $322.96

Scenario Cost/Unit: $10.77

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	1	$25.36
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	5	$151.80
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	3	$145.80

Practice: 331 - Contour Orchard and Other Perennial Crops

Scenario: #1 - Contour Orchards/Vineyards

Scenario Description:

This scenario meets the specifications of the NRCS 331 Contour Orchards and Perennial Crops Standard. This scenario applies to fields greater than 5 acres. Payment reflects the extra labor and initial supervision costs in implementing and following contour operations compared to other methods. More time is usually needed when following contour operations due to more equipment time in shorter rows and more equipment turning. Annual erosion rates for the rotation exceeds tolerance levels. Excessive runoff leads to sedimentation of waterways.

Before Situation:

The typical field size in this geographical region for this scenario is 10 acres. The field slope averages 6% while the slope length averages 160 feet. All farming operations are performed up and down the slope. Annual erosion rates for the rotation exceeds tolerance levels. Excessive runoff leads to sedimentation of waterways.

After Situation:

Implementation Requirements are prepared and implemented according to the Contour Orchards and Perennial Crops Standard (331). This practice is installed on the entire field. All field operations including: harvesting, disking, bedding, and planting are performed on the contour which is near perpendicular to the field slope. The farm manager is initially on site to ensure that equipment operators are properly following contour methods. Soil erosion rates are reduced to tolerable soil loss levels. Likewise, sedimentation has be significantly reduced.

Feature Measure: acre

Scenario Unit: Acres

Scenario Typical Size: 10.00

Scenario Total Cost: $322.96

Scenario Cost/Unit: $32.30

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	1	$25.36
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	5	$151.80
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	3	$145.80

Practice: 332 - Contour Buffer Strips

Scenario: #33 - Native Species, Foregone Income (Organic and Non-organic)

Scenario Description:

Narrow strips of permanent, herbaceous vegetative cover established around the hill slope and alternated down the slope with wider cropped strips in between that are organically or non-organically farmed on the contour. This practice applies to all cropland. Practice includes seedbed prep and planting of native species. The area of the contour grass strip is taken out of production.

Before Situation:

The NRCS water erosion prediction software indicates that there is a significant amount of sheet and rill erosion and/or a significant amount of sediment potentially delivered to the downslope edge of the field. A secondary concern is that there may not be enough wildlife/pollinator habitat, food source or refugia in the field or farm.

After Situation:

Native grasses, legumes and forbs will be established in strips in the field to meet the Contour buffer Strips (332) criteria, resource needs, and producer objectives. Minimum widths shall be based on NRCS local design criteria specific to the purpose for installing the practice. Native species shall be selected that do not function as a host for diseases of a field crop and have physical characteristics necessary to control water erosion to tolerable levels in the cropped area of the field.

Feature Measure: number of acres

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $592.17

Scenario Cost/Unit: $592.17

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	1	$6.73
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	1	$22.27
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$415.54	1	$415.54
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$12.66	1	$12.66
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$134.97	1	$134.97

Practice: 332 - Contour Buffer Strips

Scenario: #34 - Introduced Species, Foregone Income (Organic and Non-Organic)

Scenario Description:
Narrow strips of permanent, herbaceous vegetative cover established around the hill slope and alternated down the slope with wider cropped strips in between that are farmed on the contour. This practice applies to all cropland. Practice includes seedbed prep and planting of native species. The area of the contour grass strip is taken out of production. This applies to both organic and non-organic.

Before Situation:
The NRCS water erosion prediction software indicates that there is a significant amount of sheet and rill erosion and/or a significant amount of sediment potentially delivered to the downslope edge of the field. A secondary concern is that there may not be enough wildlife/pollinator habitat, food source or refugia in the field or farm.

After Situation:
Introduced grasses and legumes will be established in strips in the field to meet the Contour buffer Strips (332) criteria, resource needs, and producer objectives. Minimum widths shall be based on NRCS local design criteria specific to the purpose for installing the practice. Introduced species shall be selected that do not function as a host for diseases of a field crop and have physical characteristics necessary to control water erosion to tolerable levels in the cropped area of the field.

Feature Measure: Number of acres

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $559.56

Scenario Cost/Unit: $559.56

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	1	$6.73
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	1	$22.27
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$415.54	1	$415.54
Materials						
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	30	$20.40
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.81	20	$16.20
Sulfate of Potash	263	Approved for Organic Systems - Muriate of Potash	Pound	$0.90	20	$18.00
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$12.66	1	$12.66
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$47.76	1	$47.76

Practice: 332 - Contour Buffer Strips

Scenario: #35 - Wildlife/Pollinator, Foregone Income (Organic and Non-Organic)

Scenario Description:
Narrow strips of permanent, herbaceous vegetative cover established around the hill slope and alternated down the slope with wider cropped strips in between that are farmed on the contour. This practice applies to all cropland. Practice includes seedbed prep and planting of mainly pollinator friendly species. The area of the field border is taken out of production. This applies to organic and no-organic.

Before Situation:
Water Erosion Calculator (e.g. RUSLE2) indicates that there is a significant amount of sheet and rill erosion and/or a significant amount of sediment potentially delivered to the downslope edge of the field. A secondary concern is that there may not be enough wildlife/pollinator habitat, food source or refuge in the field or farm.

After Situation:
Plant species will be established in strips in the field to meet the Contour buffer Strips (332) criteria, resource needs, producer objectives, and the targeted wildlife/pollinators necessary food and/or cover. Minimum widths shall be based on NRCS local design criteria specific to the purpose for installing the practice. Species selected shall meet the wildlife/pollinator habitat requirements of the state and be adapted to site; not function as a host for diseases of a field crop and; have physical characteristics necessary to control sheet and rill erosion to tolerable levels on the cropped area of the field.

Feature Measure: Number of acres

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $592.17

Scenario Cost/Unit: $592.17

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	1	$6.73
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	1	$22.27
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$415.54	1	$415.54
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$12.66	1	$12.66
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$134.97	1	$134.97

Practice: 332 - Contour Buffer Strips

Scenario: #36 - Native, Foregone Income-High Value Cropland

Scenario Description:
Narrow strips of permanent, herbaceous vegetative cover established around the hill slope and alternated down the slope with wider cropped strips in between that are farmed on the contour. This practice applies to all cropland. Practice includes seedbed prep and planting of native species. The area of the contour buffer strips is taken out of production.

Before Situation:
The NRCS water erosion prediction software indicates that there is a significant amount of sheet and rill erosion and/or a significant amount of sediment potentially delivered to the downslope edge of the field. Specialty crops for market are produced on this acreage. A secondary concern is that there may not be enough wildlife/pollinator habitat, food source or refugia in the field or farm.

After Situation:
Native grasses, legumes and forbs will be established in strips in the field to meet the Contour buffer Strips (332) criteria, resource needs, and producer objectives. Minimum widths shall be based on NRCS local design criteria specific to the purpose for installing the practice. Native species shall be selected that do not function as a host for diseases of a field crop and have physical characteristics necessary to control water erosion to tolerable levels in the cropped area of the field.

Feature Measure: number of acres

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $2,265.09

Scenario Cost/Unit: $2,265.09

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	1	$6.73
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	1	$22.27
Foregone Income						
FI, Vegetables	2033	Vegetables is Primary Crop	Acres	$2,088.46	1	$2,088.46
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$12.66	1	$12.66
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$134.97	1	$134.97

Practice: 332 - Contour Buffer Strips

Scenario: #37 - Introduced-High Value Cropland

Scenario Description:
Narrow strips of permanent, herbaceous vegetative cover established around the hill slope and alternated down the slope with wider cropped strips in between that are farmed on the contour. This practice applies to all cropland. Practice includes seedbed prep and planting of mainly introduced species. The area of the field border is taken out of production.

Before Situation:
The NRCS water erosion prediction software indicates that there is a significant amount of sheet and rill erosion and/or a significant amount of sediment potentially delivered to the downslope edge of the field. Specialty crops for market are grown in this field. A secondary concern is that there may not be enough wildlife/pollinator habitat, food source or refugia in the field or farm.

After Situation:
Introduced grasses and legumes will be established in strips in the field to meet the Contour buffer Strips (332) criteria, resource needs, and producer objectives. Minimum widths shall be based on NRCS local design criteria specific to the purpose for installing the practice. Introduced species shall be selected that do not function as a host for diseases of a field crop and have physical characteristics necessary to control water erosion to tolerable levels in the cropped area of the field.

Feature Measure: Number of acres

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $2,232.48

Scenario Cost/Unit: $2,232.48

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	1	$6.73
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	1	$22.27
Foregone Income						
FI, Vegetables	2033	Vegetables is Primary Crop	Acres	$2,088.46	1	$2,088.46
Materials						
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	30	$20.40
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.81	20	$16.20
Sulfate of Potash	263	Approved for Organic Systems - Muriate of Potash	Pound	$0.90	20	$18.00
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$12.66	1	$12.66
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$47.76	1	$47.76

Practice: 332 - Contour Buffer Strips

Scenario: #38 - Wildlife/Pollinator-High Value Cropland

Scenario Description:
Narrow strips of permanent, herbaceous vegetative cover established around the hill slope and alternated down the slope with wider cropped strips in between that are farmed on the contour. This practice applies to all cropland. Practice includes seedbed prep and planting of mainly pollinator friendly species. The area of the field border is taken out of production.

Before Situation:
The NRCS water erosion prediction software indicates that there is a significant amount of sheet and rill erosion and/or a significant amount of sediment potentially delivered to the downslope edge of the field. Specialty crops for market are grown in this field. A secondary concern is that there may not be enough wildlife/pollinator habitat, food source or refugia in the field or farm.

After Situation:
Introduced grasses and legumes will be established in strips in the field to meet the Contour buffer Strips (332) criteria, resource needs, and producer objectives. Minimum widths shall be based on NRCS local design criteria specific to the purpose for installing the practice. Species selected shall meet the wildlife/pollinator habitat requirements of the state and be adapted to the site; not function as a host for diseases of a field crop and; have physical characteristics necessary to control sheet and rill erosion to tolerable levels on the cropped area of the field.

Feature Measure: Number of acres

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $2,265.09

Scenario Cost/Unit: $2,265.09

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	1	$6.73
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	1	$22.27
Foregone Income						
FI, Vegetables	2033	Vegetables is Primary Crop	Acres	$2,088.46	1	$2,088.46
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$12.66	1	$12.66
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$134.97	1	$134.97

Practice: 333 - Amending Soil Properties with Gypsum Products

Scenario: #1 - Gypsum greater than 1 ton rate

Scenario Description:

Gypsum application of more than one ton/acre rate (typical average 1.5 tons/acre) to improve surface water quality due to phosphorus, pathogens, and soil health (Ca/Mg ratio). Scenario to be used in combination with an implemented nutrient management plan. The producer will use gypsum to improve soil surface structure and reduce concentration of dissolved reactive phosphorus (DRP) in runoff. Scenario includes the cost of material, application, and supervisor/management time to establish and manage new application methodology, including rates, timing, and sequence of application with other nutrient materials (i.e., manures, bio-solids, and fertilizers).The addressed resource concern is water quality and soil health. Associated practices are Nutrient Management (590), Conservation Crop Rotation (328), Cover Crop (340), Residue and Tillage Management, No-till (329) and Residue and Tillage Management, Reduced Till (345).

Before Situation:

Cropland in continuous production having relatively low soil organic matter and moderately high clay content with application of manure with a risk of pathogens. Soil in these fields has poor soil structure and a high risk of phosphorus and pathogen runoff. The soils are susceptible to soil crusting and as a result of long term tillage systems have a high concentration of phosphorous near the soil surface. The combination of poor soil structure and high nutrient levels at the soil surface results in runoff events with high concentrations of DRP that may contribute to degraded water quality.

After Situation:

A determination based on existing soil samples used in normal nutrient management has been made. The Implementation Requirements for Amending Soil Properties with Gypsum (333) has been developed for the site. The application of gypsum to the field based on the existing soil samples will result in reduced runoff and improved runoff water quality. This condition over time in combination with an implemented nutrient management plan and supporting practices to improve soil health will improve surface water quality.

Feature Measure: Acres with a gypsum product applic

Scenario Unit: Acres

Scenario Typical Size: 40.00

Scenario Total Cost: $9,531.80

Scenario Cost/Unit: $238.30

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$9.23	40	$369.20
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	1	$48.60
Materials						
Gypsum, Ground Ag Grade, Bulk	1224	Agricultural grade quarry ground gypsum (CaCO4) for dispersive soil treatment. Materials and delivery only.	Ton	$151.90	60	$9,114.00

Practice: 333 - Amending Soil Properties with Gypsum Products

Scenario: #2 - Gypsum less than 1 ton per acre

Scenario Description:

Gypsum application of less than or equal to one ton/acre rate (typical average 1 tons/acre) to improve surface water quality due to phosphorus, pathogens, and soil health (Ca/Mg ratio). Scenario to be used in combination with an implemented nutrient management plan. The producer will use gypsum to improve soil surface structure and reduce concentration of dissolved reactive phosphorus (DRP) in runoff. Scenario includes the cost of material, application, and management time to establish and manage new application methodology, including rates, timing, and sequence of application with other nutrient materials (i.e., manures, bio-solids, and fertilizers). . The addressed resource concern is water quality and soil health. Associated practices are Nutrient Management (590), Conservation Crop Rotation (328), Cover Crop (340), Residue and Tillage Management, No-till (329) and Residue and Tillage Management, Reduced Till (345).

Before Situation:

Cropland in continuous production having relatively low soil organic matter and moderately high clay content. Soil in these fields have poor soil structure and a high risk of phosphorus and pathogen runoff. The soils are susceptible to soil crusting and as a result of long term tillage systems have high concentration of phosphorous near the soil surface. The combination of poor soil structure and high nutrient levels at the soil surface results in runoff events with high concentrations of DRP that may contribute to degraded water quality.

After Situation:

A determination based on existing soil samples used in normal nutrient management has been made. The Implementation Requirements for Amending Soil Properties with Gypsum (333) has been developed for the site. The application of gypsum to the field is based on the existing soil samples and will result in reduce runoff and improve runoff water quality. This condition over time in combination with the implemented nutrient management plan and supporting practices to improve soil health will improve surface water quality.

Feature Measure: Acres with a gypsum product applic

Scenario Unit: Acres

Scenario Typical Size: 40.00

Scenario Total Cost: $4,974.80

Scenario Cost/Unit: $124.37

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$9.23	40	$369.20
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	1	$48.60
Materials						
Gypsum, Ground Ag Grade, Bulk	1224	Agricultural grade quarry ground gypsum (CaCO4) for dispersive soil treatment. Materials and delivery only.	Ton	$151.90	30	$4,557.00

Practice: 334 - Controlled Traffic Farming

Scenario: #1 - Controlled Traffic

Scenario Description:

This practice must be part of a conservation management system to reduce soil compaction. This scenario considers the time needed to modify equipment, develop the technical skills necessary to effectively implement a controlled traffic farming system on a typical 200 acre cropland farm. The controlled traffic generally utilizes RTK automatic steering technology to locate and maintain high load field traffic. This scenario represents the costs associated with reducing the amount of surface area tracked/compacted to 33% or less. Cost represents typical situations for conventional, organic, and transitioning to organic producers.

Before Situation:

The typical scenario for this practice is a 200 acre row crop operation on high clay, poorly drained soils. Studies show that when high wheel load traffic is not controlled, up to 85% of the field is tracked causing some degree of soil compaction. Before the practice is installed traffic is uncontrolled tracking and 85% of the field has compacted soil which limits soil health.

After Situation:

An Implementation Requirement for Controlled Traffic (334) is developed and the controlled traffic lanes installed per the implementation requirements. After the practice is installed wheel/track traffic is confined to designated traffic lanes/tramlines. Wheel/track soil compaction is confined to the traffic lanes to protect the remaining surface area and subsoil from wheel/track compaction. The wheel/track traffic follows the installed traffic lanes/tramlines each year.

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 200.00

Scenario Total Cost: $12,425.60

Scenario Cost/Unit: $62.13

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	80	$3,509.60
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	80	$8,916.00

Practice: 336 - Soil Carbon Amendment

Scenario: #143 - Compost - On Site

Scenario Description:

This scenario uses compost of known origin and production methods to maintain, increase, or improve organic matter content and improve aggregate stability, habitat for soil organisms, and plant productivity and health. Compost produced in a compost facility on farm has been tested according to the Test Methods for the Examination of Composting and Compost (TMECC), or by other Land Grant University (LGU) recognized methods.

Before Situation:

An in-field assessment or a site specific resource assessment tool or test indicates that soil health resource concerns are present and the addition of analyzed and verified compost is needed to improve the condition of the soil.

After Situation:

Compost was tested and applied at the recommended rate that will improve soil organic matter and organism habitat without creating unacceptable risk of N or P loss. A follow up assessment is planned to determine the effect of the application.

Feature Measure: area treated

Scenario Unit: Acres

Scenario Typical Size: 6.00

Scenario Total Cost: $718.51

Scenario Cost/Unit: $119.75

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	10	$148.80
Manure, compost, application	955	Loading, hauling and spreading manure/compost by ground equipment. Includes equipment, power unit and labor costs.	Hours	$137.30	1.5	$205.95
Materials						
Test, Compost Analysis	307	Moisture, Total N, P, K. Includes materials and shipping only.	Each	$59.82	1	$59.82
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 336 - Soil Carbon Amendment

Scenario: #144 - Compost - Small Areas

Scenario Description:

This scenario uses compost from an offsite source to maintain, increase, or improve organic matter content and improve aggregate stability, habitat for soil organisms, and plant productivity and health. This scenario is used for situations where manual labor is typically used to apply or incorporate compost amendments. Compost has been tested according to the Test Methods for the Examination of Composting and Compost (TMECC), or by other Land Grant University (LGU) recognized methods. Compost is applied at the recommended rate to treat the identified resource concerns.

Before Situation:

An in-field assessment or a site specific resource assessment tool or test indicates that soil health resource concerns are present and the addition of analyzed and verified compost is needed to improve the condition of the soil.

After Situation:

Compost was tested and applied at the recommended rate that will improve soil organic matter and organism habitat without creating unacceptable risk of N or P loss. A follow up assessment is planned to determine the effect of the compost application.

Feature Measure: Area treated.

Scenario Unit: 1,000 Square Foot

Scenario Typical Size: 10.00

Scenario Total Cost: $536.79

Scenario Cost/Unit: $53.68

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	0.25	$3.72
Manure, compost, application	955	Loading, hauling and spreading manure/compost by ground equipment. Includes equipment, power unit and labor costs.	Hours	$137.30	0.5	$68.65
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	12	$344.52
Materials						
Compost	265	A mixture of decaying organic matter, as from leaves and manure, used to improve soil structure and provide nutrients.	Ton	$52.20	1	$52.20
Test, Compost Analysis	307	Moisture, Total N, P, K. Includes materials and shipping only.	Each	$59.82	1	$59.82
Mobilization						
Aggregate, Shipping, Cubic Yard-mile	2360	Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul).	Cubic Yard Mile	$0.42	18.75	$7.88

Practice: 336 - Soil Carbon Amendment

Scenario: #155 - Compost - Off Site

Scenario Description:

This scenario uses compost from an offsite source to maintain, increase, or improve organic matter content and improve aggregate stability, habitat for soil organisms, and plant productivity and health. Compost has been tested according to the Test Methods for the Examination of Composting and Compost (TMECC), or by other Land Grant University (LGU) recognized methods. Compost is applied at the recommended rate to treat the identified resource concerns. Typical application rate is 3 ton compost/acre.

Before Situation:

An in-field assessment or a site specific resource assessment tool or test indicates that soil health resource concerns are present and the addition of analyzed and verified compost is needed to improve the condition of the soil.

After Situation:

Compost was tested and applied at the recommended rate that will improve soil organic matter and organism habitat without creating unacceptable risk of N or P loss. A follow up assessment is planned to determine the effect of the application.

Feature Measure: acres treated

Scenario Unit: Acres

Scenario Typical Size: 6.00

Scenario Total Cost: $1,656.57

Scenario Cost/Unit: $276.10

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	10	$148.80
Manure, compost, application	955	Loading, hauling and spreading manure/compost by ground equipment. Includes equipment, power unit and labor costs.	Hours	$137.30	1.5	$205.95
Materials						
Compost	265	A mixture of decaying organic matter, as from leaves and manure, used to improve soil structure and provide nutrients.	Ton	$52.20	18	$939.60
Test, Compost Analysis	307	Moisture, Total N, P, K. Includes materials and shipping only.	Each	$59.82	1	$59.82
Mobilization						
Aggregate, Shipping, Cubic Yard-mile	2360	Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul).	Cubic Yard Mile	$0.42	720	$302.40

Practice: 338 - Prescribed Burning

Scenario: #1 - Understory Burn

Scenario Description:
Applying a prescribed burn according to designed burn plan and NRCS Prescribed Burning (338) standard and specifications. An Understory burn can consume debris or leaf litter under controlled conditions that otherwise could burn uncontrollably and devastatingly. Prior to burning unit may need to be treated to reduce slash height and quantities. Burn should be cool enough to not cause mortality to residual stand but also must reduce litter and debris. Burned firebreaks used to achieve total firebreak width are part of these burns. (Constructed firebreak cost is not included in cost of burn. Refer to Firebreak (394) standard and cost scenarios)

Before Situation:
Light slash accumulation in a open forest stand. Leaf litter and debris throughout stand. Small seedlings of various quantities may be present.

After Situation:
Litter, debris and slash are consumed, small seedlings may be killed during active burning. Residual larger trees have little to no scorching. Post treatment fire danger is significantly reduced.

Feature Measure: Acres planned

Scenario Unit: Acres

Scenario Typical Size: 160.00

Scenario Total Cost: $4,091.72

Scenario Cost/Unit: $25.57

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	8	$202.88
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	16	$290.08
Trailer, water tank	1598	Mobile 5,000 gal water tank mounted on a trailer. Equipment only. Does not include towing equipment.	Hours	$22.38	8	$179.04
Water tank, portable	1602	Portable water tank transported in a pick up truck. Typically with 200 gallon capacity includes tank with pump, hose and sprayer. Does not include the pickup truck. Equipment only.	Hours	$12.84	8	$102.72
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	32	$1,403.84
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	12	$583.20
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	8	$891.60
Materials						
Fuel, ignition fuel mixture	1596	Mixture of gasoline and diesel for ignition of prescribed burns. Materials only.	Gallons	$3.71	20	$74.20
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	2	$364.16

Practice: 338 - Prescribed Burning

Scenario: #2 - Level to Moderate Terrain, Herbaceous Fuel Non-Volatile

Scenario Description:
Applying a prescribed burn according to designed burn plan and NRCS Prescribed Burning (338) standard and specifications in order to control undesirable species, improve wildlife habitat, improve plant productivity and/or quality, facilitate grazing distribution and maintain ecological processes. This scenario is based on a burn area of less than 50 acres and applies under the following conditions: where the terrain of the majority of the area to be burned <20% slopes with herbaceous and/or low volatile woody fuel with no high volatile fuels. Burned firebreaks used to achieve total firebreak width are part of these burns. (Constructed firebreak cost is not included in cost of burn. Refer to Firebreak (394) standard and cost scenarios)

Before Situation:
Desirable plant composition is lacking due to reduced plant vigor, invasive species or improper livestock distribution.

After Situation:
Desirable plant composition is restored, plant vigor improved and invasive species reduced. Forage production and quality for livestock and /or wildlife is improved.

Feature Measure: Acres planned

Scenario Unit: Acres

Scenario Typical Size: 20.00

Scenario Total Cost: $2,271.32

Scenario Cost/Unit: $113.57

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	8	$202.88
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	8	$145.04
Water tank, portable	1602	Portable water tank transported in a pick up truck. Typically with 200 gallon capacity includes tank with pump, hose and sprayer. Does not include the pickup truck. Equipment only.	Hours	$12.84	8	$102.72
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	24	$1,052.88
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	8	$388.80
Materials						
Fuel, ignition fuel mixture	1596	Mixture of gasoline and diesel for ignition of prescribed burns. Materials only.	Gallons	$3.71	4	$14.84
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	2	$364.16

Practice: 338 - Prescribed Burning

Scenario: #3 - Level Terrain, Volatile or woody fuels

Scenario Description:

Applying a prescribed burn according to designed burn plan and NRCS Prescribed Burning (338) standard and specifications in order to control undesirable species, improve wildlife habitat, improve plant productivity and/or quality, facilitate grazing distribution and maintain ecological processes. This scenario is based on a burn area of 30 acres and applies under the following conditions: where the terrain of the majority of the area to be burned <15% slopes with herbaceous and low volatile woody fuel with high volatile woody fuels less than 4ft tall. Burned firebreaks used to achieve total firebreak width are part of these burns. (Constructed firebreak cost is not included in cost of burn. Refer to Firebreak (394) standard and cost scenarios)

Before Situation:

Desirable plant composition is lacking due to reduced plant vigor, invasive species or improper livestock distribution.

After Situation:

Desirable plant composition is restored, plant vigor improved and invasive species reduced. Forage production and quality for livestock and /or wildlife is improved.

Feature Measure: Acres planned

Scenario Unit: Acres

Scenario Typical Size: 30.00

Scenario Total Cost: $6,862.07

Scenario Cost/Unit: $228.74

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	1	$78.30
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	16	$405.76
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	16	$290.08
Trailer, water tank	1598	Mobile 5,000 gal water tank mounted on a trailer. Equipment only. Does not include towing equipment.	Hours	$22.38	16	$358.08
Water tank, portable	1602	Portable water tank transported in a pick up truck. Typically with 200 gallon capacity includes tank with pump, hose and sprayer. Does not include the pickup truck. Equipment only.	Hours	$12.84	16	$205.44
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	64	$2,807.68
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	16	$777.60
Materials						
Fuel, ignition fuel mixture	1596	Mixture of gasoline and diesel for ignition of prescribed burns. Materials only.	Gallons	$3.71	25	$92.75
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	2	$1,846.38

Practice: 338 - Prescribed Burning

Scenario: #4 - Steep Terrain, Herbaceous Fuel

Scenario Description:
Applying a prescribed burn according to designed burn plan and NRCS Prescribed Burning (338) standard and specifications in order to control undesirable species, improve wildlife habitat, improve plant productivity and/or quality, facilitate grazing distribution and maintain ecological processes. This scenario is based on a burn area 20 acres and applies under the following conditions: where the terrain of the majority of the area to be burned >20% slopes with herbaceous and/or low volatile woody fuel with no high volatile fuels. Burned firebreaks used to achieve total firebreak width are part of these burns. (Constructed firebreak cost is not included in cost of burn. Refer to Firebreak (394) standard and cost scenarios)

Before Situation:
Desirable plant composition is lacking due to reduced plant vigor, invasive species or improper livestock distribution.

After Situation:
Desirable plant composition is restored, plant vigor improved and invasive species reduced. Forage production and quality for livestock and /or wildlife is improved.

Feature Measure: Acres planned

Scenario Unit: Acres

Scenario Typical Size: 20.00

Scenario Total Cost: $4,593.96

Scenario Cost/Unit: $229.70

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	8	$202.88
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	8	$145.04
Trailer, water tank	1598	Mobile 5,000 gal water tank mounted on a trailer. Equipment only. Does not include towing equipment.	Hours	$22.38	8	$179.04
Water tank, portable	1602	Portable water tank transported in a pick up truck. Typically with 200 gallon capacity includes tank with pump, hose and sprayer. Does not include the pickup truck. Equipment only.	Hours	$12.84	8	$102.72
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	64	$2,807.68
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	16	$777.60
Materials						
Fuel, ignition fuel mixture	1596	Mixture of gasoline and diesel for ignition of prescribed burns. Materials only.	Gallons	$3.71	4	$14.84
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	2	$364.16

Practice: 338 - Prescribed Burning

Scenario: #5 - Steep Terrain, Volatile or Woody fuels

Scenario Description:

Applying a prescribed burn according to designed burn plan and NRCS Prescribed Burning (338) standard and specifications in order to control undesirable species, improve wildlife habitat, improve plant productivity and/or quality, facilitate grazing distribution and maintain ecological processes. This scenario is based on a burn area of 320 acres and applies under the following conditions: where the terrain of the majority of the area to be burned >15% slopes with herbaceous and low volatile woody fuel with high volatile woody fuels greater than 4ft tall, but fire is still a ground fire carried by fine fuel. Burned firebreaks used to achieve total firebreak width are part of these burns. (Constructed firebreak cost is not included in cost of burn. Refer to Firebreak (394) standard and cost scenarios)

Before Situation:

Desirable plant composition is lacking due to reduced plant vigor, invasive species or improper livestock distribution.

After Situation:

Desirable plant composition is restored, plant vigor improved and invasive species reduced. Forage production and quality for livestock and /or wildlife is improved.

Feature Measure: Acres planned

Scenario Unit: Acres

Scenario Typical Size: 320.00

Scenario Total Cost: $8,457.59

Scenario Cost/Unit: $26.43

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.39	1	$116.39
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	16	$405.76
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	48	$870.24
Trailer, water tank	1598	Mobile 5,000 gal water tank mounted on a trailer. Equipment only. Does not include towing equipment.	Hours	$22.38	8	$179.04
Water tank, portable	1602	Portable water tank transported in a pick up truck. Typically with 200 gallon capacity includes tank with pump, hose and sprayer. Does not include the pickup truck. Equipment only.	Hours	$12.84	16	$205.44
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	80	$3,509.60
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	24	$1,166.40
Materials						
Fuel, ignition fuel mixture	1596	Mixture of gasoline and diesel for ignition of prescribed burns. Materials only.	Gallons	$3.71	30	$111.30
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	2	$364.16
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 338 - Prescribed Burning

Scenario: #6 - Site Preparation

Scenario Description:
Treating areas to encourage natural seeding or to permit reforestation by planting or direct seeding. Burning is utilized to eliminate existing competition and debris, reduce forest fuel and to prepare the site for planting or seeding. Burning a cutover site helps prepare the site for replanting. Burn should expose a portions of bare soil for planting. Objectives of a site preparation burn may dictate timing and burn intensity.

Before Situation:
Area to be burned has had a portion of the over story removed. Slash, brush and grasses dominate the site.

After Situation:
Area to be planted has been burned to remove grass, reduce competing brush and remove downed slash leftover from forestry activities. Some bare ground is exposed.

Feature Measure: Acres planned

Scenario Unit: Acres

Scenario Typical Size: 80.00

Scenario Total Cost: $4,245.09

Scenario Cost/Unit: $53.06

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	2	$50.72
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	8	$145.04
Water tank, portable	1602	Portable water tank transported in a pick up truck. Typically with 200 gallon capacity includes tank with pump, hose and sprayer. Does not include the pickup truck. Equipment only.	Hours	$12.84	2	$25.68
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	32	$1,403.84
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	2	$57.42
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	12	$583.20
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	16	$1,783.20
Materials						
Fuel, ignition fuel mixture	1596	Mixture of gasoline and diesel for ignition of prescribed burns. Materials only.	Gallons	$3.71	3.75	$13.91
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08

Practice: 338 - Prescribed Burning

Scenario: #7 - Tribal Special Purpose

Scenario Description:
Applying a prescribed burn according to designed burn plan and NRCS Prescribed Burning (338) standard and specifications. A blueberry management burn can consume debris or leaf litter under controlled conditions that otherwise could burn uncontrollably and devastatingly. Prior to burning unit may need to be treated to reduce slash height and quantities. Burn should be cool enough to not cause mortality to residual stand but also must reduce litter and debris. Burned firebreaks used to achieve total firebreak width are part of these burns. (Constructed firebreak cost is not included in cost of burn. Refer to Firebreak (394) standard and cost scenarios)

Before Situation:
Light slash accumulation in a open forest stand. Leaf litter and debris throughout stand. Small seedlings of various quantities may be present.

After Situation:
Litter, debris and slash are consumed, small seedlings may be killed during active burning.

Feature Measure: Acres planned

Scenario Unit: Acres

Scenario Typical Size: 5.00

Scenario Total Cost: $8,319.64

Scenario Cost/Unit: $1,663.93

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	8	$202.88
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	24	$435.12
Trailer, water tank	1598	Mobile 5,000 gal water tank mounted on a trailer. Equipment only. Does not include towing equipment.	Hours	$22.38	8	$179.04
Water tank, portable	1602	Portable water tank transported in a pick up truck. Typically with 200 gallon capacity includes tank with pump, hose and sprayer. Does not include the pickup truck. Equipment only.	Hours	$12.84	8	$102.72
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	56	$2,456.72
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	56	$2,721.60
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	16	$1,783.20
Materials						
Fuel, ignition fuel mixture	1596	Mixture of gasoline and diesel for ignition of prescribed burns. Materials only.	Gallons	$3.71	20	$74.20
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	2	$364.16

Practice: 340 - Cover Crop

Scenario: #1 - Cover Crop - Basic (Organic and Non-organic)

Scenario Description:

Typically a small grain or legume (may also use forage sorghum, radishes, turnips, buckwheat, etc.) will be planted as a cover crop immediately after harvest of a row crop, and will be followed by a row crop that will utilize the residue as a mulch. This scenario assumes that seed will be planted with a drill. The cover crop should be allowed to generate as much biomass as possible, without delaying planting of the following crop. The cover crop will be terminated using an approved herbicide prior to planting the subsequent crop.

Before Situation:

Row crops such as corn, soybeans, or cotton are grown and harvested in mid-late fall. Fields are disked immediately following harvest, with rows in some fields being hipped for drainage. Residue amounts after harvest average 30% or less, resulting in bare soil being exposed to wind erosion and/or intense rainfall during the fall, winter, and early spring. Over the winter residue degrades and sediment/nutrient runoff from fields increases. Erosion exceeds soil loss tolerances. Runoff from the fields flows into streams, water courses or other water bodies causing degradation to the receiving waters. Soil health (soil organic matter) declines over time as a result of tillage practices, low residue crops, and long periods of bare soil.

After Situation:

Implementation Requirements according to Cover Crop (340) are prepared and implemented. Within 30 days after harvest of the row crop, fields are planted with a small grain or legume cover crop (may also use forage sorghum, radishes, turnips, buckwheat, etc.), typically rye or clover. The average field size is 40 acres. The cover crop is seeded with a drill. No additional fertilizer is applied with the cover crop. The cover crop provides soil cover by late fall, throughout the winter, and into the early spring. Runoff and erosion are reduced. Wind erosion is reduced by standing residues. The cover crop is terminated with an approved herbicide prior to spring planting as late as feasible to maximize plant biomass production. Over time, soil health is improved due to the additional biomass, ground cover, soil infiltration, and plant diversity introduced to the cropping system. Cover crop residues left on the surface may maximize weed control by increasing allelopathic and mulching effect.

Feature Measure: Area planted

Scenario Unit: Acres

Scenario Typical Size: 40.00

Scenario Total Cost: $3,298.00

Scenario Cost/Unit: $82.45

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	40	$269.20
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	40	$890.80
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$12.66	40	$506.40
Annual Grasses	2730	Annual grasses, one or more species, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$40.79	40	$1,631.60

Practice: 340 - Cover Crop

Scenario: #6 - Cover Crop - Adaptive Management

Scenario Description:

The practice scenario is for the implementation of cover crops in small replicated plots to allow the producer to learn how to manage cover crops on their operation. Scenario includes implementing replicated strip trials on a field plot to evaluate, identify and implement a particular cover crop management strategy (e.g., cover crop vs no cover crop, multiple species vs, single species, evaluate different termination methods or timings, using a legume vs no legume for nitrogen credits). This will be done following the guidance in the NRCS Technical Note 10 - Adaptive Management.

Before Situation:

Row crops such as corn, soybeans, or cotton are grown and harvested in mid-late fall. Fields are disked immediately following harvest, with rows in some fields being hipped for drainage. Residue amounts after harvest average 30% or less, resulting in bare soil being exposed to wind erosion and/or intense rainfall. Over the winter residue degrades and sediment/nutrient runoff from fields increases. Sheet and rill erosion occurs with visible rills by spring. Runoff from the fields flows into streams, water courses or other water bodies causing degradation to the receiving waters. Soil health (soil organic matter) declines over time as a result of tillage practices, low residue crops, and long periods of bare soil. The producer is considering the use of cover crops but is unsure how to manage on their unique operation or is seeking a way to better manage cover crops in the operation.

After Situation:

Implementation Requirements for Cover Crop (340) will be prepared along with the Adaptive Management plan for the replicated cover crop plots and implemented. Installation of this scenario will result in establishment of a cover crop replicated plots to compare to different management strategies for cover crop management following the guidance in the Agronomy Technical Note 10 - Adaptive Management. Implementation involves establishing the replicated plots to evaluate one or more cover crop management strategies. The plot will consist of at least 4 replicated plots designed, laid out, managed and evaluated with the assistance of a consultant knowledgeable in cover crop management. Results are used to make cover crop management decisions to address erosion and water quality issues. Yields will be measured and statistically summarized following the procedures in Agronomy Technical Note 10 - Adaptive Management. The yields for each plot will be adjusted to the appropriate moisture content. This would be repeated for 3 years.

Feature Measure: Based on 10 acres

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $3,056.00

Scenario Cost/Unit: $3,056.00

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	10	$67.30
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	10	$222.70
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	20	$877.40
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	40	$1,148.40
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$12.66	10	$126.60
Annual Grasses, Legumes or Forbs	2732	A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$61.36	10	$613.60

Practice: 340 - Cover Crop

Scenario: #11 - Cover Crop - Multiple Species (Organic and Non-organic)

Scenario Description:

Typically the multi-species cover crop (two or more species) mix includes a small grain, a legume, and may include other species such as forage sorghum, radishes, turnips, buckwheat, etc.). This mix will address all the purposes of the Cover Crop (340) standard. Typically the cover crop is seeded immediately after harvest of a row crop, but may be inter-seeded into a row crop using a broadcast seeder, drill, or similar device. The cover crop will be followed by another row crop and will utilize the residue as a mulch. The cover crop should be allowed to generate as much biomass as possible without delaying planting of the following crop. The cover crop will be terminated using an approved herbicide or tillage prior to planting the subsequent crop and terminated per the NRCS Cover Crop Termination Guidelines.

Before Situation:

Row crops such as corn, soybeans, or cotton are grown and harvested in mid-late fall. Fields are disked immediately following harvest with rows in some fields being hipped for drainage. Residue amounts after harvest average 30% or less resulting in bare soil being exposed to wind erosion and/or intense rainfall during the fall, winter, and early spring. Over the winter residue degrades and sediment/nutrient runoff from fields increases. Erosion exceeds soil loss tolerances. Runoff from the fields flows into streams, water courses or other water bodies causing degradation to the receiving waters. Soil health (soil organic matter) declines over time as a result of tillage practices, low residue crops, and long periods of bare soil.

After Situation:

Implementation Requirements according to Cover Crop (340) are prepared and implemented. Within 30 days after the harvest of row crop, fields are planted with a multi-species (2 or more species) cover crop mix that generally includes a small grain, a legume, and may include other species such as forage sorghum, radishes, turnips, buckwheat, etc. The average field size is 40 acres. The cover crop is seeded with a drill, broadcast seeder, aerial broadcast, or other method. No additional fertilizer is applied with the cover crop. The cover crop provides soil cover by late fall, throughout the winter, and into the early spring. Runoff and erosion are reduced. Wind erosion is reduced by standing residues. The cover crop is terminated with an approved herbicide prior to spring planting as late as feasible to maximize plant biomass production. Over time, soil health is improved due to the additional biomass, ground cover, soil infiltration, and plant diversity introduced to the cropping system. Cover crop residues left on the surface may maximize weed control by increasing allelopathic and mulching effect.

Feature Measure: Area planted

Scenario Unit: Acres

Scenario Typical Size: 40.00

Scenario Total Cost: $4,120.80

Scenario Cost/Unit: $103.02

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	40	$269.20
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	40	$890.80
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$12.66	40	$506.40
Annual Grasses, Legumes or Forbs	2732	A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$61.36	40	$2,454.40

Practice: 340 - Cover Crop

Scenario: #12 - Pac. Island Area Cover Crop

Scenario Description:

A one or more species cover crop mix is planted soon after harvest for either and organic or inorganic operation. Seed is planted using a a drill or broadcast seeder. The cover crop should be allowed to generate as much biomass as possible without delaying planting of the following crop as permitted by the NRCS Cover Crop Termination Guidelines. The cover crop will be terminated using an approved herbicide and/or by mechanical operations prior to planting the subsequent crop. The cover crop will treat erosion, improve soil quality, reduce water quality degradation by utilizing excessive soil nutrients, suppress excessive weed pressures and break pest cycles, improve soil moisture use efficiency, or minimize soil compaction.

Before Situation:

Row crops such as corn, soybeans, or vegetables are grown and harvested. Fields are disked immediately following harvest, with rows in some fields being hipped for drainage. Residue amounts after harvest average 30% or less, resulting in bare soil being exposed to wind erosion and/or intense rainfall. After harvest residue degrades and sediment/nutrient runoff from fields increases. Sheet and rill erosion occurs with visible rills. Runoff from the fields flows into streams, water courses or other water bodies causing degradation to the receiving waters. Soil health (soil organic matter) declines over time as a result of tillage practices, low residue crops, and long periods of bare soil.

After Situation:

Implementation Requirements are prepared for the site specific conditions and desired purpose(s). After harvest of row crop, fields are planted with a one or more species cover crop to address erosion, improve soil quality, reduce water quality degradation by utilizing excessive soil nutrients, suppress excessive weed pressures and break pest cycles, improve soil moisture use efficiency, or minimize soil compaction. The cover crop provides soil cover until the following crop. Runoff and erosion are reduced and no rills are visible on the soil surface in the spring. Wind erosion is reduced by standing residues. The cover crop is terminated with an approved herbicide or tillage or crimper rolling prior to establishing the next crop. Over time, soil health is improved due to the additional biomass, ground cover, soil infiltration, and plant diversity introduced to the cropping system. Cover crop residues left on the surface may maximize weed control by increasing allelopathic and mulching effect.

Feature Measure: Acres Planted

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $218.15

Scenario Cost/Unit: $218.15

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	1	$14.88
Mechanical weed control, Vegetation termination	957	Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs.	Acres	$27.07	1	$27.07
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	4	$114.84
Materials						
Annual Grasses, Legumes or Forbs	2732	A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$61.36	1	$61.36
Mobilization						
Mobilization, Pacific Island	2679	Mobilization cost of materials for sea or air freight services between islands.	Pound	$0.00	50	$0.00

Practice: 340 - Cover Crop

Scenario: #13 - Caribbean Legume Cover Crop

Scenario Description:

A legume will be planted as a cover crop immediately after harvest of a row crop, and will be followed by a row crop that will utilize fixed nitrogen and cover crop biomass as a mulch, provide erosion reduction, improve water quality, and soil health. This scenario assumes that seed will be planted with a drill. Legume seeds must be inoculated with the proper inoculant prior to planting. The cover crop should be allowed to reach early to mid-bloom before it is terminated, using an approved herbicide, in order to maximize nitrogen fixation.

Before Situation:

Fields are disked immediately following harvest, with some fields being hipped for drainage. Residue amounts after harvest average 30% or less, resulting in high erosion, impaired water quality, and degraded soil health.

After Situation:

The 340 Implementation Requirements is completed per the needed specifications for the field site. Harvest fields are planted immediately with a legume cover crop. The average field size is 5 acres. The cover crop is seeded with a drill. No fertilizer is applied with the cover crop. The cover crop provides soil cover to reduce erosion, improve water quality, and improve soil health.

Feature Measure: acres planted

Scenario Unit: Acres

Scenario Typical Size: 5.00

Scenario Total Cost: $540.00

Scenario Cost/Unit: $108.00

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	5	$111.35
Materials						
Herbicide, 2,4-D	330	Broadleaf herbicide labeled for cropland and pasture. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$10.10	5	$50.50
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$12.66	5	$63.30
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.61	5	$8.05
Annual Grasses, Legumes or Forbs	2732	A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$61.36	5	$306.80

Practice: 340 - Cover Crop

Scenario: #31 - Cover Crop - Basic Organic

Scenario Description:

'Typically a small grain or small grain-legume mix (may also use forage sorghum, radishes, turnips, buckwheat, etc) will be planted as a cover crop immediately after harvest of an organically grown crop, and will be followed by an organically grown crop that will utilize the residue as a mulch. This scenario assumes that seed will be planted with a no-till drill. The cover crop should be allowed to generate as much biomass as possible, without delaying planting of the following crop. The cover crop will be terminated using a mechnical kill method (mowing, rolling, undercutting, etc.), within weeks prior to planting the subsequent crop. This scenario REQUIRES use of Certified Organic Seed. Associated practices: Conservation Cover (327), Conservation Crop Rotation (328), Residue and Tillage Management, No-Till/Strip Till/Direct Seed (329), Critical Area Planting (342), Residue Management, Seasonal (344), Residue and Tillage Management, Mulch Till (345), Residue and Tillage Management, Ridge Till (346), Nutrient Management (590), Integrated Pest Management (595).'

Before Situation:

Organically grown crops such as various vegetable and fruit crops (along with organically produced row crops) are grown and harvested in mid-late fall. Fields are disked immediately following harvest. Residue amounts after harvest average 30% or less, resulting in bare soil being exposed to wind erosion and/or intense rainfall during the fall, winter, and early spring. Over the winter residue degrades and sediment/nutrient runoff from fields increases. Sheet and rill erosion occurs with visible rills by spring. Runoff from the fields flows into streams, water courses or other water bodies causing degradation to the receiving waters. Soil health (soil organic matter) declines over time as a result of tillage practices, low residue crops, and long periods of bare soil.

After Situation:

Within 30 days after harvest of organic crop, fields are planted with a small grain-legume mix cover crop, typically rye and clover. The average field size is 25 acres. The cover crop is seeded with a no-till drill. No additional fertilizer is applied with the cover crop. The cover crop provides soil cover by late fall, throughout the winter, and into the early spring. Runoff and erosion are reduced and no rills are visible on the soil surface in the spring. The cover crop is terminated with using a mechnical kill method (mowing, rolling, undercutting, etc.), prior to spring planting as late as feasible to maximize plant biomass production. Over time, soil health is improved due to the additional biomass, ground cover, and plant diversity introduced to the cropping system. Wind erosion is reduced by standing resides. Cover crop residues left on the surface may maximize weed control by increasing allelopathic and mulching effect.

Feature Measure: Area Planted

Scenario Unit: Acres

Scenario Typical Size: 30.00

Scenario Total Cost: $3,762.00

Scenario Cost/Unit: $125.40

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Mechanical weed control, Vegetation termination	957	Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs.	Acres	$27.07	30	$812.10
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	30	$668.10
Materials						
Certified Organic, Annual Grasses, Legumes and/or Forbs	2343	Annual grasses, mostly introduced but may be native. Used for temporary cover or cover crops. Certified organic. Includes material and shipping only.	Acres	$76.06	30	$2,281.80

Practice: 340 - Cover Crop

Scenario: #45 - Cover Crop - No Termination Needed, Basic and organic/non-organic

Scenario Description:

Typically a small grain that will effectively winter kill will be planted as a cover crop will be planted as a cover crop immediately after harvest of a row crop, and will be followed by a row crop that will utilize the residue as a mulch. This scenario assumes that seed will be planted with a drill. The cover crop should be allowed to generate as much biomass as possible, without delaying planting of the following crop. The cover crop chosen will be species that will effectively winter kill which will avoid the labor and expense involved in mechanically or chemically terminating the crop.

Before Situation:

Row crops such as corn, soybeans, or cotton are grown and harvested in mid-late fall. Fields are disked immediately following harvest, with rows in some fields being hipped for drainage. Residue amounts after harvest average 30% or less, resulting in bare soil being exposed to wind erosion and/or intense rainfall during the fall, winter, and early spring. Over the winter residue degrades and sediment/nutrient runoff from fields increases. Erosion exceeds soil loss tolerances. Runoff from the fields flows into streams, water courses or other water bodies causing degradation to the receiving waters. Soil health (soil organic matter) declines over time as a result of tillage practices, low residue crops, and long periods of bare soil.

After Situation:

Implementation requirements according to Cover Crop (340) are prepared and implemented. Within 30 days after harvest of row crop, fields are planted with a single species or mix species cover crop, as outlined in the plan details. The average lake state field size is 40 acres. The cover crop is seeded with a no-till drill, broadcast seeder, aerial seeding, or other method. No additional fertilizer is applied with the cover crop. The cover crop provides soil cover by late fall, into or throughout the winter, and potentially into the early spring. Runoff and erosion are reduced, and no rills are visible on the soil surface in the spring. The cover crop is established using winter kill species which should not require termination in the spring. Over time, soil health is improved due to the additional biomass, ground cover, and plant diversity introduced to the cropping system. Wind erosion is reduced by standing residues. Cover crop residues left on the surface may maximize weed control by increasing allelopathic and mulching effect.

Feature Measure: Area planted

Scenario Unit: Acres

Scenario Typical Size: 40.00

Scenario Total Cost: $2,192.40

Scenario Cost/Unit: $54.81

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Seeding Operation, Broadcast, Ground	959	Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs.	Acres	$14.02	40	$560.80
Materials						
Annual Grasses	2730	Annual grasses, one or more species, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$40.79	40	$1,631.60

Practice: 340 - Cover Crop

Scenario: #50 - Cover Crop - 1 acre or less

Scenario Description:

Typically a small grain or legume will be planted as a cover crop immediately after harvest of a crop, and will be followed by a crop. This scenario assumes that seed will be planted by hand. The cover crop should be allowed to generate as much biomass as possible, without delaying planting of the following crop. The cover crop will typically be terminated by mowing or tilling prior to planting the subsequent crop.

Before Situation:

Crops such as sweet corn, vegetables, or root crops are grown and harvested in mid-late fall. Fields are disked immediately following harvest, with rows in some fields being hipped for drainage. Residue amounts after harvest average 30% or less, resulting in bare soil being exposed to wind erosion and/or intense rainfall during the fall, winter, and early spring. Over the winter residue degrades and sediment/nutrient runoff from fields increases. Erosion exceeds soil loss tolerances. Runoff from the fields flows into streams, water courses or other water bodies causing degradation to the receiving waters. Soil health (soil organic matter) declines over time as a result of tillage practices, low residue crops, and long periods of bare soil.

After Situation:

Implementation Requirements according to Cover Crop (340) are prepared and implemented. Within 10 days after harvest of the crop, fields are planted with a small grain or legume cover crop, typically rye or clover. The average field size is 0.25 acres. The cover crop is seeded by hand. No additional fertilizer is applied with the cover crop. The cover crop provides soil cover by late fall, throughout the winter, and into the early spring. Runoff and erosion are reduced. Wind erosion is reduced by standing residues. The cover crop is terminated with an approved herbicide prior to spring planting as late as feasible to maximize plant biomass production. Over time, soil health is improved due to the additional biomass, ground cover, soil infiltration, and plant diversity introduced to the cropping system. Cover crop residues left on the surface may maximize weed control by increasing allelopathic and mulching effect.

Feature Measure: area planted

Scenario Unit: Acres

Scenario Typical Size: 0.25

Scenario Total Cost: $139.03

Scenario Cost/Unit: $556.13

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	1	$25.36
Walk-behind Rototiller	2723	8 hp walk-behind rototiller, one-day rental	Day	$163.65	0.25	$40.91
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	2	$57.42
Materials						
Annual Grasses, Legumes or Forbs	2732	A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$61.36	0.25	$15.34

Practice: 340 - Cover Crop

Scenario: #67 - Mechanical Termination of Cover Crop per 1000 square feet

Scenario Description:

Typical cover crop is more than one plant species, planted immediately after harvest of a crop and will be followed by a new crop. Cover crops are planted in the production bed typically 4000 square feet. Implementation is mostly hand labor or labor intensive. Cover crop is mechanically terminated in urban agricultural sites with State and local laws, ordinance and zoning restrictions on use of agrichemicals.

Before Situation:

Crop rotation include specialty crops such sweet corn, vegetables, or root crops are grown and harvested through out growing season and into mid-late fall. Residue amounts after harvest average 30% or less, resulting in bare soil being exposed to wind erosion and/or intense rainfall during the fall, winter, and early spring. Over the winter residue degrades and sediment/nutrient runoff from fields increases. Erosion exceeds soil loss tolerances. Runoff from the fields flows into streams, water courses or other water bodies causing degradation to the receiving waters. Soil health (soil organic matter) declines over time as a result of tillage practices, low residue crops, and long periods of bare soil.

After Situation:

Implementation Requirements according to Cover Crop (340) are prepared and implemented. The cover crop is seeded by hand. No additional fertilizer is applied with the cover crop. The cover crop provides soil cover at the critical period when cover is needed usually late fall, throughout the winter, and into the early spring. Runoff and erosion are reduced. Wind erosion is reduced by standing residues. The cover crop is mechanically terminated as late as feasible to maximize cover crop biomass production and meet the planting date needs of the next crop. Over time, soil health is improved due to additions of biomass, improvement of aggregate stability and infiltration/aeration.

Feature Measure: Area of Cover Crop Installed

Scenario Unit: 1,000 Square Foot

Scenario Typical Size: 4.00

Scenario Total Cost: $120.71

Scenario Cost/Unit: $30.18

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	1	$14.88
Mechanical weed control, Vegetation termination	957	Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs.	Acres	$27.07	1.5	$40.61
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	1	$22.27
Materials						
Annual Grasses, Legumes or Forbs	2732	A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$61.36	0.7	$42.95

Practice: 340 - Cover Crop

Scenario: #68 - Multi-species Cover Crop per 1000 square feet

Scenario Description:

Typical cover crop is more than one plant species, planted immediately after harvest of a crop and will be followed by a new crop. Cover crops are planted in the production bed typically 4000 square feet. Implementation is mostly hand labor or labor intensive. Cover crop is mechanically terminated in urban agricultural sites with State and local laws, ordinance and zoning restrictions on use of agrichemicals.

Before Situation:

Crop rotation include specialty crops such sweet corn, vegetables, or root crops are grown and harvested through out growing season and into mid-late fall. Residue amounts after harvest average 30% or less, resulting in bare soil being exposed to wind erosion and/or intense rainfall during the fall, winter, and early spring. Over the winter residue degrades and sediment/nutrient runoff from fields increases. Erosion exceeds soil loss tolerances. Runoff from the fields flows into streams, water courses or other water bodies causing degradation to the receiving waters. Soil health (soil organic matter) declines over time as a result of tillage practices, low residue crops, and long periods of bare soil.

After Situation:

Implementation Requirements according to Cover Crop (340) are prepared and implemented. The cover crop is seeded by hand. No additional fertilizer is applied with the cover crop. The cover crop provides soil cover at the critical period when cover is needed usually late fall, throughout the winter, and into the early spring. Runoff and erosion are reduced. Wind erosion is reduced by standing residues. The cover crop is mechanically terminated as late as feasible to maximize cover crop biomass production and meet the planting date needs of the next crop. Over time, soil health is improved due to additions of biomass, improvement of aggregate stability and infiltration/aeration.

Feature Measure: Area of Cover Crop Installed

Scenario Unit: 1,000 Square Foot

Scenario Typical Size: 4.00

Scenario Total Cost: $256.40

Scenario Cost/Unit: $64.10

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	1	$14.88
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	1	$22.27
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$81.82	2	$163.64
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$12.66	1	$12.66
Annual Grasses, Legumes or Forbs	2732	A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$61.36	0.7	$42.95

Practice: 342 - Critical Area Planting

Scenario: #1 - Native or Introduced Vegetation - Normal Tillage (Organic and Non-Organic)

Scenario Description:
Establishment of permanent vegetation (Native and Introduced) on a site (both organic and non-organic) that is void or nearly void of vegetation due to a natural occurrence or a newly constructed conservation practice. Costs include seedbed preparation with typical tillage implements, grass/legume seed, companion crop, and fertilizer and lime with application.

Before Situation:
Areas that are void or nearly void of vegetation, resulting in bare soil being exposed to erosive processes. The exposed areas may be caused from recent natural occurrences (fire, flood, wind, etc.) or due to newly constructed conservation practices such as waterways, terraces, water and sediment basins or dams. The exposed areas will be subject to wind and water erosion that exceed soil loss tolerances. Runoff from the area flows into streams, water courses or other water bodies causing degradation to the receiving waters. The soil typically has a pH imbalance and low fertility.

After Situation:
Implementation Requirements are prepared and implemented according to the Critical Area Planting (342) standard. This typical 1.0 acre critical area is stabilized by applying fertilizer, lime and seed. Soil amendments will be incorporated at a depth of four to six inches to improve fertility and ensure establishment of permanent vegetative cover. The site will be stabilized, erosion reduced, and offsite damages reduced/eliminated.

Feature Measure: area seeded

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $320.68

Scenario Cost/Unit: $320.68

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	2	$29.76
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.61	1	$7.61
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	1	$22.27
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$10.18	1	$10.18
Materials						
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	30	$20.40
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.81	60	$48.60
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	60	$40.80
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$26.18	2	$52.36
Introduced Perennial Grasses, Legumes and/or Forbs, High Density	2749	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping.	Acres	$88.70	1	$88.70

Practice: 342 - Critical Area Planting

Scenario: #4 - Native or Introduced Vegetation - Moderate Grading (Organic and Non-Organic)

Scenario Description:
Establishment of permanent vegetation (native and introduced) on a site that is void or nearly void of vegetation due to a natural or human disturbance. Costs include a dozer for grading and shaping of small gullies, seedbed preparation with typical tillage implements, grass/legume seed, companion crop, and fertilizer and lime with application.

Before Situation:
Areas that are void or nearly void of vegetation, resulting in bare soil being exposed to erosive processes. The exposed areas may be caused from natural occurrences (fire, flood, etc.) or human disturbance. The exposed areas have visible rills and small gullies averaging 1 foot in depth and 1 foot in width that requires some moderate grading to prepare a seedbed. Runoff from the area flows into streams, water courses or other water bodies causing degradation to the receiving waters. The soil typically has a pH imbalance and low fertility.

After Situation:
Implementation Requirements are prepared and implemented according to the Critical Area Planting (342) standard.. This typical 1.0 acre critical area is stabilized by grading and shaping the small gullies with a dozer and then applying fertilizer, lime and seed. The site will be stabilized, erosion reduced, and offsite damages reduced/eliminated.

Feature Measure: area seeded

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $835.19

Scenario Cost/Unit: $835.19

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	4	$313.20
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	2	$29.76
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.61	1	$7.61
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	1	$22.27
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$10.18	1	$10.18
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	4	$160.52
Materials						
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	30	$20.40
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.81	60	$48.60
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	60	$40.80
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$26.18	2	$52.36
Annual Grasses	2730	Annual grasses, one or more species, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$40.79	1	$40.79
Introduced Perennial Grasses, Legumes and/or Forbs, High Density	2749	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping.	Acres	$88.70	1	$88.70

Practice: 342 - Critical Area Planting

Scenario: #6 - Native or Introduced Vegetation - Heavy Grading (Organic and Non-Organic)

Scenario Description:
Establishment of permanent vegetation on a site that is void or nearly void of vegetation due to a natural or human disturbance. Costs include a dozer for grading and shaping of moderate to severe gullies, seedbed preparation with typical tillage implements, grass/legume seed, companion crop, and fertilizer and lime with application.

Before Situation:
Areas that are void or nearly void of vegetation, resulting in bare soil being exposed to erosive processes. The exposed areas may be caused from natural occurrences (fire, flood, etc.) or human disturbance. The exposed areas have visible rills and moderate to severe gullies averaging 3 feet in depth and 3 feet in width. Runoff from the area flows into streams, water courses or other water bodies causing degradation to the receiving waters. The soil typically has a pH imbalance and low fertility.

After Situation:
Implementation Requirements are prepared and implemented according to the Critical Area Planting (342) standard. This typical 1.0 acre critical area is stabilized by grading and shaping the moderate to severe gullies with a dozer and then applying fertilizer, lime and seed. The site will be stabilized, erosion reduced, and offsite damages reduced/eliminated.

Feature Measure: area seeded

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $1,240.78

Scenario Cost/Unit: $1,240.78

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	8	$626.40
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	2	$29.76
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.61	1	$7.61
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	1	$22.27
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$10.18	1	$10.18
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	8	$321.04
Materials						
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	30	$20.40
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.81	60	$48.60
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	60	$40.80
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$26.18	2	$52.36
Annual Grasses, Legumes or Forbs	2732	A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$61.36	1	$61.36

Practice: 342 - Critical Area Planting

Scenario: #13 - Caribbean Critical Area Planting Heavy Grading

Scenario Description:
Establishment of permanent vegetation on a site that is void or nearly void of vegetation due to a natural or human disturbance. Costs include a dozer for grading and shaping of moderate to severe gullies, seedbed preparation with typical tillage implements, seeding, and mulching as needed by the unique site.

Before Situation:
Areas that are void or nearly void of vegetation, resulting in bare soil being exposed to erosive processes. The exposed areas may be caused from natural occurrences (fire, flood, etc) or human disturbance. The exposed areas have visible rills and moderate gullies.

After Situation:
Implementation Requirements for 342 Critical Area Planting is prepared for the unique site conditions. This typical 1.0 acre critical area is stabilized by grading and shaping the moderate to severe gullies with a dozer, seedbed preparation, applying fertilizer, lime and seed. The site is stabilized by permanent vegetation which controls soil erosion and mitigates offsite sedimentation.

Feature Measure: Acres treated

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $1,215.48

Scenario Cost/Unit: $1,215.48

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	8	$626.40
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	1	$25.36
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	1	$22.27
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	8	$321.04
Materials						
Nitrogen (N), Ammonium Sulfate	70	Price per pound of N supplied by Ammonium Sulfate. Price is not per pound of total product applied, no conversion is needed.	Pound	$1.03	50	$51.50
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.81	50	$40.50
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	50	$34.00
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$26.18	1	$26.18
Introduced Perennial Grasses, Legumes and/or Forbs, Medium Density	2748	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Includes material and shipping.	Acres	$68.23	1	$68.23

Practice: 342 - Critical Area Planting

Scenario: #14 - Caribbean Critical Area Planting - Normal Tillage

Scenario Description:
Establishment of permanent vegetation on a site that is void or nearly void of vegetation due to a natural occurrence or a newly constructed conservation practice. Costs include seedbed preparation with typical tillage implements, grass/legume seed, fertilizer, and mulch.

Before Situation:
Areas that are void or nearly void of vegetation, resulting in bare soil being exposed to erosive processes. The exposed areas may be caused from recent natural occurrences (fire, flood, wind, etc.) or due to newly constructed conservation practices such dams.

After Situation:
The Implementation Requirements with site specific specifications is prepared for each site. This typical 1.0 acre critical area is stabilized by applying fertilizer, lime, seed, and mulch. Vegetation is established, the soil is stabilized.

Feature Measure: Areas treated

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $542.04

Scenario Cost/Unit: $542.04

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	1	$25.36
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	1	$22.27
Materials						
Nitrogen (N), Ammonium Sulfate	70	Price per pound of N supplied by Ammonium Sulfate. Price is not per pound of total product applied, no conversion is needed.	Pound	$1.03	50	$51.50
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.81	50	$40.50
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	50	$34.00
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$26.18	1	$26.18
Straw	1237	Small grain straw (non organic and certified organic). Includes materials only.	Ton	$137.00	2	$274.00
Introduced Perennial Grasses, Legumes and/or Forbs, Medium Density	2748	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Includes material and shipping.	Acres	$68.23	1	$68.23

Practice: 342 - Critical Area Planting

Scenario: #15 - US Virgin Island Critical Area Planting - Normal Tillage

Scenario Description:
Establishment of permanent vegetation on a site that is void or nearly void of vegetation due to a natural or human disturbance. Costs include tillage for seedbed preparation with typical tillage implements, grass/legume seed, companion crop, and fertilizer and lime with application, and mulch.

Before Situation:
Areas that are void or nearly void of vegetation, resulting in bare soil being exposed to erosive processes. The exposed areas may be caused from natural occurrences (fire, flood, etc) or human disturbance. Runoff from the area flows into streams, water courses or other water bodies causing degradation to the receiving waters. The soil typically has a pH imbalance and low fertility.

After Situation:
Implementation Requirements are prepared according to the 342 Critical Area Planting standard and implemented. This typical 1.0 acre critical area is stabilized by applying fertilizer, lime, seed, and mulch. The site will be stabilized, erosion reduced, and offsite damages reduced/eliminated.

Feature Measure: Acres treated

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $897.80

Scenario Cost/Unit: $897.80

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	1	$25.36
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	2	$29.76
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	1	$22.27
Materials						
Nitrogen (N), Ammonium Sulfate	70	Price per pound of N supplied by Ammonium Sulfate. Price is not per pound of total product applied, no conversion is needed.	Pound	$1.03	50	$51.50
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.81	50	$40.50
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	50	$34.00
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$26.18	1	$26.18
Introduced Perennial Grasses, Legumes and/or Forbs, Medium Density	2748	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Includes material and shipping.	Acres	$68.23	1	$68.23
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	600	$600.00

Practice: 342 - Critical Area Planting

Scenario: #16 - US Virgin Islands Critical Area Planting - Heavy Grading

Scenario Description:
Establishment of permanent vegetation on a site that is void or nearly void of vegetation due to a natural or human disturbance. Costs include a dozer for grading and shaping of moderate to severe gullies, seedbed preparation with typical tillage implements, grass/legume seed, companion crop,fertilizer and lime with application, and mulch.

Before Situation:
Areas that are void or nearly void of vegetation, resulting in bare soil being exposed to erosive processes. The exposed areas may be caused from natural occurrences (fire, flood, etc) or human disturbance. The exposed areas have visible rills and moderate to severe gullies averaging 3 feet in depth and 3 feet in width. Runoff from the area flows into streams, water courses or other water bodies causing degradation to the receiving waters. The soil typically has a pH imbalance and low fertility.

After Situation:
Implementation Requirements are prepared according to the 342 Critical Area Planting standard for the unique site requirements and implemented. This typical 1.0 acre critical area is stabilized by grading and shaping the moderate to severe gullies with a dozer and then applying fertilizer, lime, seed, and mulch. The site will be stabilized, erosion reduced, and offsite damages reduced/eliminated.

Feature Measure: Acres Treated

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $1,845.24

Scenario Cost/Unit: $1,845.24

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	8	$626.40
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	1	$25.36
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	2	$29.76
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	1	$22.27
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	8	$321.04
Materials						
Nitrogen (N), Ammonium Sulfate	70	Price per pound of N supplied by Ammonium Sulfate. Price is not per pound of total product applied, no conversion is needed.	Pound	$1.03	50	$51.50
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.81	50	$40.50
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	50	$34.00
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$26.18	1	$26.18
Introduced Perennial Grasses, Legumes and/or Forbs, Medium Density	2748	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Includes material and shipping.	Acres	$68.23	1	$68.23
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	600	$600.00

Practice: 342 - Critical Area Planting

Scenario: #17 - Pacific Island Critical Area Planting

Scenario Description:

Establishment of permanent vegetation (Native or Introduced) on a site that is void or nearly void of vegetation due to a natural or human disturbance. Costs include a dozer for grading and shaping of moderate to severe gullies, seedbed preparation with typical tillage implements, grass/legume seed, companion crop, and fertilizer and lime with application.

Before Situation:

Areas that are void or nearly void of vegetation, resulting in bare soil being exposed to erosive processes. The exposed areas may be caused from natural occurrences (fire, flood, etc) or human disturbance. The exposed areas have visible rills and moderate to severe gullies averaging 3 feet in depth and 3 feet in width. Runoff from the area flows into streams, water courses or other water bodies causing degradation to the receiving waters. The soil typically has a pH imbalance and low fertility.

After Situation:

Implementation Requirements are prepared according to the 342 Critical Area Planting standard and implemented. This typical 1.0 acre critical area is stabilized by grading and shaping the small gullies with a dozer and then applying fertilizer, lime and seed. The site will be stabilized, erosion reduced, and offsite damages reduced/eliminated.

Feature Measure: Acres Treated

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $1,635.87

Scenario Cost/Unit: $1,635.87

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	8	$626.40
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	2	$29.76
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	1	$22.27
Materials						
Native Perennial Grasses, Medium Density	2751	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Includes material and shipping.	Acres	$192.81	1	$192.81
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 342 - Critical Area Planting

Scenario: #18 - PIA - Criteria Area Planting

Scenario Description:
Establishment of permanent vegetation on a (Organic and Non-Organic) site that is void or nearly void of vegetation due to a natural occurrence or a newly constructed conservation practice. Costs include seedbed preparation with typical tillage implements, native grass seed, and trees/shrubs.

Before Situation:
Areas that are void or nearly void of vegetation, resulting in bare soil being exposed to erosive processes. The exposed areas may be caused from recent natural occurrences (fire, flood, wind, etc.) or due to newly constructed conservation practices such as waterways, terraces, water and sediment basins or dams. The exposed areas will be subject to wind and water erosion that exceed soil loss tolerances. Runoff from the area flows into streams, water courses or other water bodies causing degradation to the receiving waters. The soil typically has a pH imbalance and low fertility.

After Situation:
Implementation Requirements are prepared according to the 342 Critical Area Planting Standard and implemented. This typical 1.0 acre critical area is stabilized by applying seed and some trees and shrubs. The site will be stabilized, erosion reduced, and offsite damages reduced/eliminated.

Feature Measure: Acres Treated

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $1,347.16

Scenario Cost/Unit: $1,347.16

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	2	$29.76
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$10.18	1	$10.18
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	24	$689.04
Materials						
Shrub, Potted, Small	1524	Potted shrub seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$7.79	50	$389.50
Native and Introduced Perennial Grasses, Legumes and/or Forbs, High Density	2757	A mix of native and introduced perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping.	Acres	$228.68	1	$228.68
Mobilization						
Mobilization, Pacific Island	2679	Mobilization cost of materials for sea or air freight services between islands.	Pound	$0.00	55	$0.00

Practice: 342 - Critical Area Planting

Scenario: #30 - Hydroseeding

Scenario Description:
Establishment of permanent vegetation on a site that is void or nearly void of vegetation due to a natural occurrence or a newly constructed conservation practice. Costs include hydroseeding seed onto sloped site. Generally used on small sites and planned and installed on a square foot basis.

Before Situation:
Areas that are void or nearly void of vegetation, resulting in bare soil being exposed to erosive processes. The exposed areas may be caused from recent natural occurrences (flood, fire, wind, etc.) or due to newly constructed conservation practices such as waterways, terraces, water and sediment basins or dams. The exposed areas will be subject to wind erosion, sheet and rill erosion, or visible rills may have already occurred. Runoff from the area flows into streams, water courses or other water bodies causing degradation to the receiving waters. The soil typically has a pH imbalance and low fertility.

After Situation:
This typical 10,890 square feet, or 0.25 acre, critical area is stabilized by hydroseeding application of seed to ensure establishment of permanent vegetative cover. Prepare a firm, weed free seedbed so that proper germination and stand establishment are ensured. Once the seedbed has been prepared, hydroseed the following mixture for a vegetative cover: Smooth Bromegrass (15lbs/acre), and Red Clover (8lbs/ac) with a nurse crop of oats at a seeding rate of 48lbs per acre, or 43,560 square feet.

Feature Measure: area planted

Scenario Unit: Square Feet

Scenario Typical Size: 10,890.00

Scenario Total Cost: $1,066.03

Scenario Cost/Unit: $0.10

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Seeding Operation, hydroseeder	1291	Hydroseeding with typical 1500 to 3600 gallon seeder. Includes all costs for equipment, power unit, and labor.	Acres	$1,116.88	0.25	$279.22
Materials						
Introduced Perennial Grasses, Legumes and/or Forbs, High Density	2749	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping.	Acres	$88.70	0.25	$22.18
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 342 - Critical Area Planting

Scenario: #45 - Grass Plugs

Scenario Description:
Dune and Lakeshore stabilization of critical areas with planting of beach grass plugs on 18'x18' spacing. Used to stabilized sandy sites prone to wind and water erosion. Normally planned and installed on a per square foot basis.

Before Situation:
Dune and Lakeshore area has erosion and degradation of site. Habitat is damaged. Sensitive area is being degraded by wind erosion.

After Situation:
Sites targeted as critical dunes and lakeshores are protected by growth of grasses. Great Lakes Restoration Initiative goals for erosion control area achieved. Great Lake States native beach grass plugs purchased and installed with hand planting.

Feature Measure: area planted

Scenario Unit: Square Feet

Scenario Typical Size: 43,560.00

Scenario Total Cost: $6,415.58

Scenario Cost/Unit: $0.15

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Ground sprigging	1101	Includes costs for equipment, power unit and labor.	Acres	$66.64	1	$66.64
Materials						
Perennial Grass Culms or Stems, each	2696	Perennial grasses used across a large area using vegetative propagules including culms or stems. Includes materials and shipping.	Each	$0.31	19500	$6,045.00
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 342 - Critical Area Planting

Scenario: #54 - Native or Introduced Vegetation including shrub planting - Normal Tillage

Scenario Description:
Establishment of permanent vegetation (Native and Introduced) on a site that is void or nearly void of vegetation due to a natural occurrence or a newly constructed conservation practice. Costs include seedbed preparation with typical tillage implements, grass/legume seed, companion crop, and planting of shrubs.

Before Situation:
Areas that are void or nearly void of vegetation, resulting in bare soil being exposed to erosive processes. The exposed areas may be caused from recent natural occurrences (fire, flood, wind, etc.) or due to newly constructed conservation practices such as waterways, terraces, water and sediment basins or dams. The exposed areas will be subject to wind and water erosion that exceed soil loss tolerances. Runoff from the area flows into streams, water courses or other water bodiescausing degradation to the receiving waters.

After Situation:
Implementation Requirements are prepared and implemented according to the Critical Area Planting (342) standard. This typical 1.0 acre critical area is stabilized by seed. Planting of shrubs will be used in areas most susceptible to erosion. Proper site preparation, seeding and planting will ensure establishment of permanent vegetative cover. The site will be stabilized, erosion reduced, and offsite damages reduced/eliminated.

Feature Measure: Area Seeded and Planted

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $1,248.82

Scenario Cost/Unit: $1,248.82

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	1	$14.88
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	1	$22.27
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$10.18	1	$10.18
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Materials						
Shrub, Potted, Small	1524	Potted shrub seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$7.79	100	$779.00
Native Perennial Grasses, Medium Density	2751	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Includes material and shipping.	Acres	$192.81	1	$192.81

Practice: 342 - Critical Area Planting

Scenario: #58 - Permanent Cover

Scenario Description:
Establishment of permanent vegetation on a site that is void of vegetation or needs to improve the vegetation to adequately cover the existing site soil to reduce particulate matter dust emissions. Costs include seedbed prep with light tillage, seed, fertilizer and lime. Small Scale fields and urban sites have soil conditions limiting vegetation growth or sensitive areas that need protection.

Before Situation:
Fields are bare or sparsely vegetated exposed to wind and water erosion. Soil physical of chemical properties limit vegetative growth. Urban site soils contain heavy metal contaminants at risk of emissions as particulate dust from field activities.

After Situation:
The Implementation Requirement with site specific instruction is prepared for each treatment site. The establishment of permanent vegetation will stabilize the soil. Sensitive areas are protected. Particulate dust is reduced. Wind and water erosion loss is within tolerance levels (T).

Feature Measure: planted area

Scenario Unit: 1,000 Square Foot

Scenario Typical Size: 15.00

Scenario Total Cost: $319.76

Scenario Cost/Unit: $21.32

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	2	$50.72
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	0.8	$11.90
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	0.4	$8.91
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	6	$172.26
Materials						
Nitrogen (N), Ammonium Sulfate	70	Price per pound of N supplied by Ammonium Sulfate. Price is not per pound of total product applied, no conversion is needed.	Pound	$1.03	5	$5.15
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.81	5	$4.05
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	5	$3.40
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$14.19	1	$14.19
Straw	1237	Small grain straw (non organic and certified organic). Includes materials only.	Ton	$137.00	0.1	$13.70
Introduced Perennial Grasses, Legumes and/or Forbs, High Density	2749	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping.	Acres	$88.70	0.4	$35.48

Practice: 345 - Residue and Tillage Management, Reduced Till

Scenario: #2 - Residue and Tillage Management, Reduced Till

Scenario Description:

Mulch-till is managing the amount, orientation and distribution of crop and other plant residue on the soil surface year round while limiting the soil-disturbing activities used to grow crops in systems where the entire field surface is tilled by the planter/drill or tillage tools prior to planting. This practice includes tillage methods commonly referred to as mulch tillage, vertical tillage, chiseling and disking, or the use of high disturbance drills without additional tillage. It applies to stubble mulching on summer-fallowed land, to tillage for annually planted crops, to tillage for planted crops and to tillage for planting perennial crops. All residue shall be uniformly spread or managed over the surface throughout the critical erosion period(s). All residue shall be uniformly distributed over the entire field and not burned or removed. These periods of intensive tillage have led to excessive soil loss, often above the soil loss tolerance (T), due to the loss of crop residue on the soil surface. The NRCS erosion prediction model(s) will be used to review the farming operations and determine the amount of surface residue to manage throughout the rotation to keep soil loss below T. The producer will adopt a reduced till system to meet one or more of the practice purposes.

Before Situation:

Crops such as corn, soybeans, small grains, or cotton are grown and harvested. Fields are tilled immediately following harvest, with rows in some fields being hipped for drainage. Residue amounts after harvest average 30% or less, resulting in bare soil being exposed to wind erosion and/or intense rainfall during the fall, winter, and early spring. Over the winter residue degrades and sediment/nutrient runoff from fields increase. Sheet, rill and wind erosion occurs. Spring tillage and seedbed preparation activities occur as early as possible in the late winter and early spring. Runoff from the fields flows into streams, water courses or other water bodies causing water quality degradation. Soil health (soil organic matter) declines over time as a result of tillage practices, low residue monocultures, and long periods of bare soil.

After Situation:

The Implementation Requirements are prepared following the criteria in the 345 Residue and Tillage Management, Reduced Till conservation practice standard. Reduced till applies to all cropland and other lands where crops are planted. This scenario includes the use of a reduce till systems and high disturbance drills, such as a hoe drill, air seeder, or no-till drill that disturbs a large percentage of soil surface during the planting operation. The residue that remains on the soil surface provides soil cover during late fall, throughout the winter, and into the early spring. Runoff and water/wind erosion are reduced and water quality improves. Over time, soil health is improved due to less tillage, the additional biomass, ground cover, soil infiltration, and plant diversity in the cropping system.

Feature Measure: Area planted

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $2,311.00

Scenario Cost/Unit: $23.11

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Seeding Operation, No Till/Strip Till Planter	1230	No Till/Strip Till row planters for seeding. Includes all costs for equipment, power unit, and labor.	Acres	$23.11	100	$2,311.00

Practice: 345 - Residue and Tillage Management, Reduced Till

Scenario: #3 - Mulch till-Adaptive Management

Scenario Description:

The practice scenario is for the implementation of mulch till in small replicated plots to allow the producer to learn how to manage mulch till on their operation. Scenario includes implementing replicated strip trials on a field plot to evaluate, identify and implement a particular mulch till management strategy (e.g., mulch till vs. conventional till, two different mulch till systems, etc.). This will be done following the guidelines outlined in Agronomy Technical Note 10 - Adaptive Management.

Before Situation:

Row crops such as corn, soybeans, or cotton are grown and harvested in mid-late fall. Fields are disked immediately following harvest, with rows in some fields being hipped for drainage. Residue amounts after harvest average 30% or less, resulting in bare soil being exposed to wind erosion and/or intense rainfall. Over the winter residue degrades and sediment/nutrient runoff from fields increases. Erosion exceeds soil loss tolerances. Spring tillage and seedbed preparation activities occur as early as possible in the late winter and early spring prior to planting. Weed control is accomplished primarily through tillage, requiring multiple operations. Runoff from the fields flows into streams, water courses or other water bodies causing degradation to the receiving waters. Soil health (soil organic matter) declines over time as a result of tillage practices, low residue monocultures, and long periods of bare soil. The producer is considering using mulch till technology, but is unsure how to manage on their operation or needs to improve the management of mulch till to be successful.

After Situation:

Implementation Requirements and the Adaptive Management Plan is prepared for the plots and implemented. Installation of this scenario will result in establishment of mulch till replicated plots to compare to different management strategies for mulch till and other residue management strategies following the guidelines outlined in Agronomy Technical Note 10 - Adaptive Management and the Adaptive Management Guidance 345 for Mulch Till. Implementation involves establishing the replicated plots to evaluate one or more reduced till management strategies. The plot will consist of at least four replicated plots designed, laid out, managed and evaluated with the assistance of a consultant knowledgeable in reduced till management. Results are used to make reduced till management decisions to address erosion, soil health, and water quality issues. Yields will be measured and statistically summarized following the procedures in Agronomy Technical Note 10 - Adaptive Management. The yields for each plot will be adjusted to the appropriate moisture content and residue levels measured as needed. This practice will be repeated for three years.

Feature Measure: Based on 20 acres

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $4,581.00

Scenario Cost/Unit: $4,581.00

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	20	$297.60
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acres	$22.61	20	$452.20
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	10	$222.70
Seeding Operation, No Till/Strip Till Planter	1230	No Till/Strip Till row planters for seeding. Includes all costs for equipment, power unit, and labor.	Acres	$23.11	10	$231.10
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	40	$1,148.40
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	20	$2,229.00

Practice: 345 - Residue and Tillage Management, Reduced Till

Scenario: #45 - Reduced Till Sweep for No Burn/Sweep Beds - Sugarcane Production in Louisiana

Scenario Description:

In this scenario, sugarcane producers will be migrating from a system of burning residue immediately after harvest in the fall and winter to a system that discontinues burning and allows residue to be swept into furrows. No burning will take place during the management period. Adopting this system will improve soil quality, reduce erosion, and improve air quality in sensitive areas.

Before Situation:

Sugarcane residue is typically burned immediately after harvest in the fall and early winter. After burning, beds may be reshaped with tillage. Any crop residue that is present degrades and sediment/nutrient runoff from fields increases during rainfall events. Sheet and rill erosion occurs with visible signs of soil erosion by spring. Sensitive receptors near sugarcane fields will be exposed to increased particulate matter and degraded air quality during burning events.

After Situation:

After harvest in the fall or winter, residue will be swept from the sugarcane row tops into the furrows. Residue will not be burned. In the early spring, row reshaping (off-bar and lay-by tillage) will occur as necessary. Over time, soil health is improved due to the additional crop residues, ground cover, and soil infiltration.

Feature Measure: Acres

Scenario Unit: Acres

Scenario Typical Size: 200.00

Scenario Total Cost: $4,522.00

Scenario Cost/Unit: $22.61

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acres	$22.61	200	$4,522.00

Practice: 345 - Residue and Tillage Management, Reduced Till

Scenario: #59 - Reduced Tillage less than 0.5 acres

Scenario Description:

Scenario applies to Urban sites less than a 1/2 acre with a rotation of organic or non-organic specialty crops (fruits and vegetable) are produced as part of a conservation management system to treat one or more of the following resource concerns: 1) Reduce sheet, rill and wind erosion, 2) Maintain or increase soil health and organic matter content, 3) Improve soil moisture efficiency, 4) Reduce plant pest pressures. This practice payment effectively implements a reduced tillage system on a typical urban specialty crop farm. Cost represents typical situations for organic and non-organic producers.

Before Situation:

This rotation consisted of growing specialty crops. Fields range from nearly flat to B and C slopes. Erosion, soil quality, and pest management are the primary concern. Removal of residue from the planted area is common leaving bare soil-residue amounts average 10% or less. Full width tillage is performed prior to planting . Weed control is typically by cultivation.

After Situation:

The implementation requirements are written following CPS 345 Residue and Tillage Management, Reduced Tillage to treat one or more of the following resource concerns on organic and non- organic farms: reduce sheet, rill and wind erosion, maintain or increase soil health and organic matter content, improve soil moisture efficiency or reduce plant pest pressure. Soil disturbance is minimized with no-till drill or planter use. May include single slot opener and seedling or plug planting follows. When pest management requires the removal of crop residue then planting beds are covered with cover crop using the 340 Cover Crop conservation practice. Runoff and erosion are reduced below T. No observed rills. Wind erosion reduced by maintaining surface cover. Over time, soil health is improved due to less tillage, the additional biomass, ground cover, soil infiltration, and plant diversity in the cropping system.

Feature Measure: area planted

Scenario Unit: 1,000 Square Foot

Scenario Typical Size: 15.00

Scenario Total Cost: $557.70

Scenario Cost/Unit: $37.18

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	0.17	$3.79
Seeding Operation, No Till/Strip Till Planter	1230	No Till/Strip Till row planters for seeding. Includes all costs for equipment, power unit, and labor.	Acres	$23.11	0.17	$3.93
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	9	$258.39
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	6	$291.60

Practice: 348 - Dam, Diversion

Scenario: #62 - Rock/Gravel Fill

Scenario Description:

A rock structure with a gravel bedding on geotextile is built to divert all or part of the water from a waterway or a stream to provide water in such a manner that it can be controlled and used beneficially for irrigation, livestock water, fire control, municipal or industrial uses, develop renewable energy systems, or recreation, to divert periodic damaging flows from one watercourse to another watercourse thereby reducing the damage potential of the flows. This structure will address the resource concerns of inefficient water use on Irrigated Land, inadequate water for livestock, and inadequate water supply for other beneficial uses.

Before Situation:

This practice applies where a diversion dam is needed as an integral part of an irrigation system or a water-spreading system designed to facilitate the conservation use of soil and water resources, Diversion of water from an unstable watercourse to a stable watercourse is desirable, The water supply available is adequate for the purpose for which it is to be diverted, Adverse environmental impacts resulting from the installation of the practice can be overcome. This standard applies to structures of a permanent nature, constructed of materials having an expected life span consistent with the purpose for which the structure is designed. It does not apply where conservation practice standard Diversion (362), Floodwater Diversion (400), Dam (402), or Grade Stabilization Structure (410) would be used. This practice will provide beneficial uses for irrigation, livestock water, fire control, municipal or industrial uses, renewable energy systems, recreation, or to divert periodic damaging flows from one watercourse to another watercourse thereby reducing the damage potential of the flows.

After Situation:

A rock structure of approximately 1050 cubic yards with a gravel bedding of approximately 450 cubic yards on approximately 200 square yards of geotextile, built to divert all or part of the water from a waterway or a stream. This standard applies to structures of a permanent nature, constructed of materials having an expected life span consistent with the purpose for which the structure is designed. This structure will be an integral part of an irrigation system or a water-spreading system designed to facilitate the conservation use of soil and water resources, or diversion of water from an unstable watercourse to a stable watercourse as needed. The water supply available is adequate for the purpose for which it is to be diverted. Adverse environmental impacts resulting from the installation of the practice must be overcome. The rock structure provides beneficial uses for irrigation, livestock water, fire control, municipal or industrial uses, renewable energy systems, recreation, or to divert periodic damaging flows from one watercourse to another watercourse thereby reducing the damage potential of the flows. Any needed vegetation of disturbed areas must use Critical Area Planting (342). Other associated practices such as Channel Vegetation (322), Stream Habitat Improvement and Management (395), Channel Stabilization (584) will be as appropriate. Any needed head gates or flap gates to control the quantity of water being diverted must use Structure for Water Control (587).

Feature Measure: Fill in Cubic Yards

Scenario Unit: Cubic Yards

Scenario Typical Size: 1,500.00

Scenario Total Cost: $157,768.32

Scenario Cost/Unit: $105.18

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement.	Cubic Yards	$136.88	1050	$143,724.00
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	450	$13,662.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	0.5	$382.32

Practice: 348 - Dam, Diversion

Scenario: #63 - Earth Fill

Scenario Description:
An earth fill built to divert all or part of the water from a waterway or a stream to provide water in such a manner that it can be controlled and used beneficially for irrigation, livestock water, fire control, municipal or industrial uses, develop renewable energy systems, or recreation, to divert periodic damaging flows from one watercourse to another watercourse thereby reducing the damage potential of the flows. This structure will address the resource concerns of inefficient water use on Irrigated Land, inadequate water for livestock, and inadequate water supply for other beneficial
uses.

Before Situation:
This practice applies where a diversion dam is needed as an integral part of an irrigation system or a water-spreading system designed to facilitate the conservation use of soil and water resources, Diversion of water from an unstable watercourse to a stable watercourse is desirable, The water supply available is adequate for the purpose for which it is to be diverted, Adverse environmental impacts resulting from the installation of the practice can be overcome. This standard applies to structures of a permanent nature, constructed of materials having an expected life span consistent with the purpose for which the structure is designed. It does not apply where conservation practice standard Diversion (362), Floodwater Diversion (400), Dam (402), or Grade Stabilization Structure (410) would be used. This practice will provide beneficial uses for irrigation, livestock water, fire control, municipal or industrial uses, renewable energy systems, recreation, or to divert periodic damaging flows from one watercourse to another watercourse thereby reducing the damage potential of the flows.

After Situation:
An earth fill structure of approximately 1500 cubic yards is built to divert all or part of the water from a waterway or a stream. This standard applies to structures of a permanent nature, constructed of materials having an expected life span consistent with the purpose for which the structure is designed. This structure will be an integral part of an irrigation system or a water-spreading system designed to facilitate the conservation use of soil and water resources, or diversion of water from an unstable watercourse to a stable watercourse as needed. The water supply available is adequate for the purpose for which it is to be diverted. Adverse environmental impacts resulting from the installation of the practice must be overcome. The earth fill structure provides beneficial uses for irrigation, livestock water, fire control, municipal or industrial uses, renewable energy systems, recreation, or to divert periodic damaging flows from one watercourse to another watercourse thereby reducing the damage potential of the flows. Any needed vegetation of disturbed areas must use Critical Area Planting (342). Other associated practices such as Channel Vegetation (322), Stream Habitat Improvement and Management (395), Channel Stabilization (584) will be as appropriate. Any needed head gates or flap gates to control the quantity of water being diverted must use Structure for Water Control
(587).

Feature Measure: Volume of Earth Fill

Scenario Unit: Cubic Yards

Scenario Typical Size: 1,500.00

Scenario Total Cost: $10,494.68

Scenario Cost/Unit: $7.00

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Scraper, self propelled, 21 CY	1208	Self propelled earthmoving scraper with 21 CY capacity. Does not include labor.	Hours	$296.28	30	$8,888.40
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	30.5	$1,223.97
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	0.5	$382.32

Practice: 348 - Dam, Diversion

Scenario: #64 - Earth Fill-Grouted Rock

Scenario Description:

An earth fill and grouted rock structure built to divert all or part of the water from a waterway or a stream to provide water in such a manner that it can be controlled and used beneficially for irrigation, livestock water, fire control, municipal or industrial uses, develop renewable energy systems, or recreation, to divert periodic damaging flows from one watercourse to another watercourse thereby reducing the damage potential of the flows. This structure will address the resource concerns of inefficient water use on Irrigated Land, inadequate water for livestock, and inadequate water supply for other beneficial uses.

Before Situation:

This practice applies where a diversion dam is needed as an integral part of an irrigation system or a water-spreading system designed to facilitate the conservation use of soil and water resources, Diversion of water from an unstable watercourse to a stable watercourse is desirable, The water supply available is adequate for the purpose for which it is to be diverted, Adverse environmental impacts resulting from the installation of the practice can be overcome. This standard applies to structures of a permanent nature, constructed of materials having an expected life span consistent with the purpose for which the structure is designed. It does not apply where conservation practice standard Diversion (362), Floodwater Diversion (400), Dam (402), or Grade Stabilization Structure (410) would be used. This practice will provide beneficial uses for irrigation, livestock water, fire control, municipal or industrial uses, renewable energy systems, recreation, or to divert periodic damaging flows from one watercourse to another watercourse thereby reducing the damage potential of the flows.

After Situation:

An earth fill and grouted rock structure of approximately 1050 cubic yards of earth fill with 450 cubic yards of grouted rock is built to divert all or part of the water from a waterway or a stream. This standard applies to structures of a permanent nature, constructed of materials having an expected life span consistent with the purpose for which the structure is designed. This structure will be an integral part of an irrigation system or a water-spreading system designed to facilitate the conservation use of soil and water resources, or diversion of water from an unstable watercourse to a stable watercourse as needed. The water supply available is adequate for the purpose for which it is to be diverted. Adverse environmental impacts resulting from the installation of the practice must be overcome. The earth fill and grouted rock structure provides beneficial uses for irrigation, livestock water, fire control, municipal or industrial uses, renewable energy systems, recreation, or to divert periodic damaging flows from one watercourse to another watercourse thereby reducing the damage potential of the flows. Any needed vegetation of disturbed areas must use Critical Area Planting (342). Other associated practices such as Channel Vegetation (322), Stream Habitat Improvement and Management (395), Channel Stabilization (584) will be as appropriate. Any needed head gates or flap gates to control the quantity of water being diverted must use Structure for Water Control (587).

Feature Measure: Volume of Total Fill

Scenario Unit: Cubic Yards

Scenario Typical Size: 1,500.00

Scenario Total Cost: $69,938.43

Scenario Cost/Unit: $46.63

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Scraper, self propelled, 21 CY	1208	Self propelled earthmoving scraper with 21 CY capacity. Does not include labor.	Hours	$296.28	21	$6,221.88
Rock Riprap, grouted	1757	Grouted Rock Riprap, includes materials, local delivery within 20 miles of quarry, and placement.	Cubic Yards	$138.87	450	$62,491.50
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	21	$842.73
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	0.5	$382.32

Practice: 348 - Dam, Diversion

Scenario: #65 - Sheet Pile Structure

Scenario Description:

A sheet pile structure with rock, built to divert all or part of the water from a waterway or a stream to provide water in such a manner that it can be controlled and used beneficially for irrigation, livestock water, fire control, municipal or industrial uses, develop renewable energy systems, or recreation, to divert periodic damaging flows from one watercourse to another watercourse thereby reducing the damage potential of the flows. This structure will address the resource concerns of inefficient water use on Irrigated Land, inadequate water for livestock, and inadequate water supply for other beneficial uses.

Before Situation:

This practice applies where a diversion dam is needed as an integral part of an irrigation system or a water-spreading system designed to facilitate the conservation use of soil and water resources, Diversion of water from an unstable watercourse to a stable watercourse is desirable, The water supply available is adequate for the purpose for which it is to be diverted, Adverse environmental impacts resulting from the installation of the practice can be overcome. This standard applies to structures of a permanent nature, constructed of materials having an expected life span consistent with the purpose for which the structure is designed. It does not apply where conservation practice standard Diversion (362), Floodwater Diversion (400), Dam (402), or Grade Stabilization Structure (410) would be used. This practice will provide beneficial uses for irrigation, livestock water, fire control, municipal or industrial uses, renewable energy systems, recreation, or to divert periodic damaging flows from one watercourse to another watercourse thereby reducing the damage potential of the flows.

After Situation:

A sheet pile structure of approximately 3000 square feet with approximately 660 cubic yards of riprap is built to divert all or part of the water from a waterway or a stream. This standard applies to structures of a permanent nature, constructed of materials having an expected life span consistent with the purpose for which the structure is designed. This structure will be an integral part of an irrigation system or a water-spreading system designed to facilitate the conservation use of soil and water resources, or diversion of water from an unstable watercourse to a stable watercourse as needed. The water supply available is adequate for the purpose for which it is to be diverted. Adverse environmental impacts resulting from the installation of the practice must be overcome. The sheet pile structure provides beneficial uses for irrigation, livestock water, fire control, municipal or industrial uses, renewable energy systems, recreation, or to divert periodic damaging flows from one watercourse to another watercourse thereby reducing the damage potential of the flows. Any needed vegetation of disturbed areas must use Critical Area Planting (342). Other associated practices such as Channel Vegetation (322), Stream Habitat Improvement and Management (395), Channel Stabilization (584) will be as appropriate. Any needed head gates or flap gates to control the quantity of water being diverted must use Structure for Water Control (587).

Feature Measure: Area of sheet pile

Scenario Unit: Square Feet

Scenario Typical Size: 3,000.00

Scenario Total Cost: $205,594.01

Scenario Cost/Unit: $68.53

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Sheet piling, steel, 15 ft.	1337	Steel sheet pile, panels or barrier driven up to 15 feet and left in place. Includes materials, equipment and labor.	Square Feet	$37.75	3000	$113,250.00
Portable Welder	1407	Portable field welder. Equipment only. Labor not included.	Hours	$19.45	24	$466.80
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	24.5	$1,074.82
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement.	Cubic Yards	$136.88	660	$90,340.80
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	0.5	$461.60

Practice: 348 - Dam, Diversion

Scenario: #66 - Reinforced Concrete Dam Diversion

Scenario Description:

A reinforced concrete dam diversion structure built to divert all or part of the water from a waterway or a stream to provide water in such a manner that it can be controlled and used beneficially for irrigation, livestock water, fire control, municipal or industrial uses, develop renewable energy systems, or recreation, to divert periodic damaging flows from one watercourse to another watercourse thereby reducing the damage potential of the flows. This structure will address the resource concerns of inefficient water use on Irrigated Land, inadequate water for livestock, and inadequate water supply for other beneficial uses.

Before Situation:

This practice applies where a diversion dam is needed as an integral part of an irrigation system or a water-spreading system designed to facilitate the conservation use of soil and water resources, Diversion of water from an unstable watercourse to a stable watercourse is desirable, The water supply available is adequate for the purpose for which it is to be diverted, Adverse environmental impacts resulting from the installation of the practice can be overcome. This standard applies to structures of a permanent nature, constructed of materials having an expected life span consistent with the purpose for which the structure is designed. It does not apply where conservation practice standard Diversion (362), Floodwater Diversion (400), Dam (402), or Grade Stabilization Structure (410) would be used. This practice will provide beneficial uses for irrigation, livestock water, fire control, municipal or industrial uses, renewable energy systems, recreation, or to divert periodic damaging flows from one watercourse to another watercourse thereby reducing the damage potential of the flows.

After Situation:

A reinforced concrete dam diversion structure of approximately 1500 cubic yards of concrete is built to divert all or part of the water from a waterway or a stream. This standard applies to structures of a permanent nature, constructed of materials having an expected life span consistent with the purpose for which the structure is designed. This structure will be an integral part of an irrigation system or a water-spreading system designed to facilitate the conservation use of soil and water resources, or diversion of water from an unstable watercourse to a stable watercourse as needed. The water supply available is adequate for the purpose for which it is to be diverted. Adverse environmental impacts resulting from the installation of the practice must be overcome. The reinforced concrete structure provides beneficial uses for irrigation, livestock water, fire control, municipal or industrial uses, renewable energy systems, recreation, or to divert periodic damaging flows from one watercourse to another watercourse thereby reducing the damage potential of the flows. Any needed vegetation of disturbed areas must use Critical Area Planting (342). Other associated practices such as Channel Vegetation (322), Stream Habitat Improvement and Management (395), Channel Stabilization (584) will be as appropriate. Any needed head gates or flap gates to control the quantity of water being diverted must use Structure for Water Control (587).

Feature Measure: Volume of Total Fill

Scenario Unit: Cubic Yards

Scenario Typical Size: 1,500.00

Scenario Total Cost: $853,252.38

Scenario Cost/Unit: $568.83

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	1500	$850,620.00
Dozer, 200 HP	928	Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included.	Hours	$182.87	10	$1,828.70
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	10.5	$421.37
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	0.5	$382.32

Practice: 350 - Sediment Basin

Scenario: #9 - Excavated volume

Scenario Description:

An excavated sediment basin in an existing drainage way on a farm for purpose of trapping sediment and preserving the capacity of reservoirs, ditches, canals, diversions, waterways and streams and to prevent undesirable deposition on bottom lands and other developed lands. The sediment basin is created solely by excavation and impounds less than 3 feet against the embankment or spoil. Excavated material is spoiled, not placed in a designed embankment. Earthen spillway is constructed as needed. Resource concerns addressed include excessive suspended sediment and turbidity in surface water, damage from sediment deposition, and reduced capacity of conveyances by sediment deposition. Surface water causes the sediment (and potentially pesticides and nutrients) to be transported into the riparian areas and water bodies downstream.

Before Situation:

Disturbed areas on all land uses that have excessive erosion lead to deterioration of receiving waters due to excessive sedimentation.

After Situation:

'The typical sediment basin is constructed by excavating 1500 cubic yards and spreading the spoil outside the pool area using a dozer or similar excavation equipment. The sediment storage capacity should be a minimum of 900 cubic feet per acre of disturbed area. The detention storage should be a minimum of 3600 cubic feet per acre of drainage area. Associated practice(s): Other practices that may need to be implemented along with sediment basin to address all of the site specific resource concerns include: Critical Area Planting (342) and Mulching (484) where necessary to prevent erosion following construction activities, Structure for Water Control (587) if using a dewatering device, Pond Sealing or Lining (521A,521B,521C,521D).

Feature Measure: Excavated volume

Scenario Unit: Cubic Yards

Scenario Typical Size: 1,500.00

Scenario Total Cost: $4,033.73

Scenario Cost/Unit: $2.69

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$100.26	23	$2,305.98
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	24	$963.12
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 350 - Sediment Basin

Scenario: #10 - Embankment earthen basin with pipe

Scenario Description:
An low hazard class embankment earthen sediment basin in an existing drainage way on a farm for purpose of trapping sediment and preserving the capacity of reservoirs, ditches, canals, diversions, waterways and streams and to prevent undesirable deposition on bottom lands and other developed lands. An earthen embankment will be constructed with a principal spillway conduit and earthen auxiliary spillway, as designed. Resource concerns addressed include excessive suspended sediment and turbidity in surface water, damage from sediment deposition, and reduced capacity of conveyances by sediment deposition. Surface water causes the sediment (and potentially pesticides and nutrients) to be transported into the riparian areas and water bodies downstream.

Before Situation:
Disturbed areas on all land uses that have excessive erosion lead to deterioration of receiving waters due to excessive sedimentation.

After Situation:
The typical sediment basin is constructed by excavating the pool area, constructing the auxiliary spillway, preparing the foundation as designed, and using 1500 cubic yards to create an embankment. The embankment will be designed and constructed according the Pond standard (378). The product of the storage times the effective height of the dam is less than 3,000. The effective height of the dam is 35 feet or less. The sediment storage capacity should be a minimum of 900 cubic feet per acre of disturbed area. The detention storage should be a minimum of 3600 cubic feet per acre of drainage area. The principal spillway is created using an approved conduit material and filter diaphragm. The earthen auxiliary spillway will be constructed as designed based on Pond standard (378). Associated practice(s): Other practices that may need to be implemented along with sediment basin to address all of the site specific resource concerns include: Critical Area Planting (342) and Mulching (484) where necessary to prevent erosion following construction activities, Structure for Water Control (587) if using a dewatering device, Pond Sealing or Lining (521A,521B,521C,521D).

Feature Measure: Embankment volume

Scenario Unit: Cubic Yards

Scenario Typical Size: 1,500.00

Scenario Total Cost: $10,345.12

Scenario Cost/Unit: $6.90

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	3	$1,701.24
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$100.26	23	$2,305.98
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	8	$350.96
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	24	$963.12
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	19.6	$565.66
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	1.6	$48.58
Pipe, CMP, 18-16 gauge, weight priced	1322	18 and 16 gauge galvanized helical corrugated metal pipe priced by the weight of the pipe materials. Materials only.	Pound	$2.00	1662	$3,324.00
Trash Guard, metal	1608	Trash Guard, fabricated-steel, includes materials, equipment, and labor to transport and place Conical shaped trash guard for drop inlet spillway. Typically fabricated of CMP and steel. Includes materials, equipment, and labor to fabricate and transport.	Pound	$2.72	118	$320.96
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 351 - Well Decommissioning

Scenario: #1 - Dug Well

Scenario Description:
An inactive, abandoned, or unusable water well (Shallow well or hand dug well 36 inches in diameter and 20 feet deep) will be sealed and permanently closed to prevent excess nutrients in surface and groundwater and to eliminate pesticides transported to surface and ground water. Well will be cleared of all equipment and materials. Residual water column must be treated with a disinfectant (chlorine concentration of >50 ppm) or according to local, State, Tribal, or Federal regulations.

Before Situation:
Shallow well or hand dug well 36 inches in diameter and 20 feet deep that is not being used.

After Situation:
Procedures and sealing materials shall conform to ASTM D5299 and be compatible with all local, State, Tribal, and Federal requirements. Place compacted earthfill in the well up to five feet from the surface. The top five feet of the well is filled with cement grout or bentonite. Associated practices: 342 Critical Area Seeding

Feature Measure: Each Well to be Decommissioned

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $1,778.73

Scenario Cost/Unit: $1,778.73

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	5.3	$33.13
Materials						
Grout, cement	1333	Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite gout mixtures. Includes materials, equipment and labor to place.	Cubic Yards	$763.61	1.8	$1,374.50
Chlorine	1335	Liquid chlorine bleach. Includes materials only.	Gallons	$6.95	1	$6.95
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	2	$364.16

Practice: 351 - Well Decommissioning

Scenario: #2 - Shallow Drilled Well Sealed with Grout

Scenario Description:
A licensed well driller will seal and permanently close an inactive, abandoned, or unusable water well (drilled or driven well with a 6' diameter casing and a depth of 50 feet or less) to prevent excess nutrients in surface and groundwater and to eliminate pesticides transported to surface and ground water. The well is a sandpoint or well or located in alluvium with no embedment in bedrock. Well will be cleared of all equipment and materials. Residual water column must be treated with chlorine concentration of >50 ppm or according to local, State, Tribal, or Federal regulations.

Before Situation:
A drilled or driven well with a 6' diameter casing and a depth of 50 feet that is not being used

After Situation:
Procedures and sealing materials shall conform to ASTM D5299 and be compatible with all local, State, Tribal, and Federal requirements. A pit is dug so that the top 6 feet of the casing can be cut off, and fill is recompacted in the pit after the well is sealed. Grout shall be pumped into the well casing that is left in place starting at the bottom and working toward the top. Associated practices: 342 Critical Area Seeding

Feature Measure: Each Well to be Decommissioned

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $1,380.83

Scenario Cost/Unit: $1,380.83

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	26	$162.50
Hydraulic Excavator, .5 CY	930	Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included.	Hours	$101.18	1	$101.18
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	1	$40.13
Materials						
Grout, cement	1333	Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite gout mixtures. Includes materials, equipment and labor to place.	Cubic Yards	$763.61	0.4	$305.44
Chlorine	1335	Liquid chlorine bleach. Includes materials only.	Gallons	$6.95	1	$6.95
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 351 - Well Decommissioning

Scenario: #3 - Drilled Well Sealed with Bentonite

Scenario Description:
A licensed well driller will seal and permanently close an inactive, abandoned, or unusable water well (6' diameter casing and a depth of 150 feet) to prevent excess nutrients in surface and groundwater and to eliminate pesticides transported to surface and ground water. Well will be cleared of all equipment and materials. Residual water column must be treated with chlorine concentration of >50 ppm or according to local, State, Tribal, or Federal regulations.

Before Situation:
A drilled or driven well with a 6' diameter casing and a depth of 150 feet that is not being used

After Situation:
Procedures and sealing materials shall conform to ASTM D5299 and be compatible with all local, State, Tribal, and Federal requirements. A pit is dug so that the top 6 feet of the casing can be cut off, and fill is recompacted in the pit after the well is sealed. Bentonite chips shall be screened and dropped into the well casing that is left in place in a manner that prevents bridging of the bentonite. Associated practices: 342 Critical Area Seeding

Feature Measure: Each Well to be Decommissioned

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $2,777.36

Scenario Cost/Unit: $2,777.36

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	26	$162.50
Hydraulic Excavator, .5 CY	930	Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included.	Hours	$101.18	1	$101.18
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	3	$131.61
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	1	$40.13
Materials						
Bentonite	41	Bentonite, includes materials (50# bag)	Each	$36.52	43	$1,570.36
Chlorine	1335	Liquid chlorine bleach. Includes materials only.	Gallons	$6.95	1	$6.95
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 351 - Well Decommissioning

Scenario: #4 - Deep Drilled Well - Bedrock Not Present

Scenario Description:
A licensed well driller will seal and permanently close an inactive, abandoned, or unusable water well (6 inches in diameter and the depth is 100 feet) to prevent excess nutrients in surface and groundwater and to eliminate pesticides transported to surface and ground water. The well is located in alluvial material where bedrock is not present. Well will be cleared of all equipment and materials. Residual water column must be treated with chlorine concentration of >50 ppm or according to local, State, Tribal, or Federal regulations.

Before Situation:
A well casing is 6 inches in diameter and the depth is 100 feet that is not being used.

After Situation:
Procedures and sealing materials shall conform to ASTM D5299 and be compatible with all local, State, Tribal, and Federal requirements. A pit is dug so that the top 6 feet of the casing can be cut off, and fill is recompacted in the pit after the well is sealed. Backfill shall be placed and compacted in a manner that minimizes segregation and bulking to prevent surface subsidense. The drilled well is seald with a mixture of pea gravel and grout. Associated practices: 342 Critical Area Seeding

Feature Measure: Depth of Well

Scenario Unit: Feet

Scenario Typical Size: 100.00

Scenario Total Cost: $1,686.28

Scenario Cost/Unit: $16.86

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	26	$162.50
Hydraulic Excavator, .5 CY	930	Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included.	Hours	$101.18	1	$101.18
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	1	$40.13
Materials						
Grout, cement	1333	Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite gout mixtures. Includes materials, equipment and labor to place.	Cubic Yards	$763.61	0.8	$610.89
Chlorine	1335	Liquid chlorine bleach. Includes materials only.	Gallons	$6.95	1	$6.95
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 351 - Well Decommissioning

Scenario: #5 - Deep Drilled Well - Bedrock Present

Scenario Description:
A licensed well driller will seal and permanently close an inactive, abandoned, or unusable water well (6 inches in diameter and the depth is 100 feet) to prevent excess nutrients in surface and groundwater and to eliminate pesticides transported to surface and ground water. The well is drilled into bedrock or Karst. Well will be cleared of all equipment and materials. Residual water column must be treated with chlorine concentration of >50 ppm or according to local, State, Tribal, or Federal regulations.

Before Situation:
A well casing is 6 inches in diameter and the depth is 100 feet that is not being used.

After Situation:
Procedures and sealing materials shall conform to ASTM D5299 and be compatible with all local, State, Tribal, and Federal requirements. A pit is dug so that the top 6 feet of the casing can be cut off, and fill is recompacted in the pit after the well is sealed. Backfill shall be placed and compacted in a manner that minimizes segregation and bulking to prevent surface subsidense. The drilled well is seald with a mixture of pea gravel and grout. Associated practices: 342 Critical Area Seeding

Feature Measure: Depth of Well

Scenario Unit: Feet

Scenario Typical Size: 100.00

Scenario Total Cost: $2,602.61

Scenario Cost/Unit: $26.03

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	26	$162.50
Hydraulic Excavator, .5 CY	930	Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included.	Hours	$101.18	1	$101.18
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	1	$40.13
Materials						
Grout, cement	1333	Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite gout mixtures. Includes materials, equipment and labor to place.	Cubic Yards	$763.61	2	$1,527.22
Chlorine	1335	Liquid chlorine bleach. Includes materials only.	Gallons	$6.95	1	$6.95
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 353 - Monitoring Well

Scenario: #5 - Borehole, 100 Ft. Depth or Less

Scenario Description:

A vertical borehole designed and installed 100 feet or less in depth to verify the expected groundwater level and/or hydrogeologic information. The well provides controlled access for identifing groundwater levels near an agricultural waste storage or treatment facility to determine groundwater levels, detect seepage, or monitor groundwater quality. Installation methods must be in conformance with ASTM D5092. The resource concerns addressed include groundwater contamination and groundwater quality.

Before Situation:

This practice applies to the design, installation, and development of monitoring wells where an agricultural waste storage or treatment facility is being planned. The deterination of the groundwater depth, level and recharge response is needed. The monitoring well is a component of an agricultural waste management system.

After Situation:

Typical installation of a vertical borehole for a monitoring well 100 feet deep or less that provides controlled access to obtain water samples for deterimining the groundwater levels near an an agricultural waste storage or treatment facility as a component of an agricultural waste management system. The monitoring well is installed by drilling an 4 inch borehole, installing a protective casing, a 2 inch riser pipe, a well screen, and filter pack. The installation method was in conformance with ASTM D5092. Vegetation of disturbed areas will be completed under critical area planting (342). Erosion control during construction activities will use Stormwater Runoff Control (570). Other associated practices include Access Control (472), Water Well Decommissioning (351), Waste Storage Facility (313), Pond Sealing or Lining practices 520, 521 or 522, and Pumping Plant (533).

Feature Measure: Depth of Monitoring Well

Scenario Unit: Feet

Scenario Typical Size: 20.00

Scenario Total Cost: $3,434.79

Scenario Cost/Unit: $171.74

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Rotary Drill Rig	1595	Rotary drill rig including equipment and power unit costs. Labor not included.	Hours	$353.09	4	$1,412.36
Materials						
Bentonite	41	Bentonite, includes materials (50# bag)	Each	$36.52	2	$73.04
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	2	$60.72
Aggregate, gravel, washed, pea gravel	1331	Washed and graded pea gravel river stone. Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$32.50	0.5	$16.25
Grout, cement	1333	Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite gout mixtures. Includes materials, equipment and labor to place.	Cubic Yards	$763.61	1	$763.61
Well Cap, 4 in.	1785	Well cap, 4 inch. Materials only.	Each	$36.66	1	$36.66
Well Casing, Plastic, 4 in.	1803	PVC or ABS non-threaded well casing, 4 inch. Materials only.	Feet	$6.06	20	$121.20
Well Screen, plastic, 4 in.	1998	4 inch PVC well screen. Materials only.	Feet	$8.77	10	$87.70
Centralizer, stainless steel, 2 inch	2298	Stainless steel centralizer to stabilize and center pipe in groundwater monitoring and other well installations. Materials only.	Each	$31.95	3	$95.85
End Cap, PVC, 2 in.	2301	PVC End cap used in groundwater monitoring and other well installations. Materials only.	Each	$2.77	1	$2.77
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 355 - Groundwater Testing

Scenario: #1 - Basic Water Test

Scenario Description:
Typical scenario includes the professional testing for nitrates, nitrites, and coliform to confirm well water meets basic water quality standards for consumption by livestock or use in irrigation. Water samples are sent to an EPA or state certified laboratory for testing. This scenario is recommended when water quality is suspected to be acceptable.

Before Situation:
There are no known contaminants of the well, however, neighboring wells have known issues with nitrates, or coliform, and confirmation of acceptable water quality is desired. Manure is spread near to the well, following a nutrient management plan; well contamination is unlikely but possible.

After Situation:
Water quality results are known.

Feature Measure: No.

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $71.16

Scenario Cost/Unit: $71.16

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	0.5	$14.36
Materials						
Test, Standard Water Test, Irrigation Suitability	310	Irrigation water suitability lab analysis. Includes pH, alkalinity, carbonates/bicarbonates, EC, dissolved solids, B, Cl, Ca, Mg, Na, SAR, and hardness.	Each	$56.80	1	$56.80

Practice: 355 - Groundwater Testing

Scenario: #2 - Specialty Water Test

Scenario Description:

Typical scenario includes the professional testing for pesticides, heavy metals, VOC's or other less common substances, in addition to the basic water test items. Tests are intended to confirm well water meets water quality standards for consumption by livestock or use in irrigation. Water samples are sent to an EPA or state certified laboratory for testing. This scenario is recommended when water quality is suspected to be degraded due to a specialized substance.

Before Situation:

There are no known contaminants of the well, however, neighboring wells have known issues with water quality, and confirmation of acceptable water quality is desired. Manure, pesticides, or other potential contaminants have been spread near to the well, in an unmanaged manner; well contamination is possible.

After Situation:

Water quality results are known.

Feature Measure: No.

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $281.73

Scenario Cost/Unit: $281.73

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	0.5	$14.36
Materials						
Test, Standard Water Test, Irrigation Suitability	310	Irrigation water suitability lab analysis. Includes pH, alkalinity, carbonates/bicarbonates, EC, dissolved solids, B, Cl, Ca, Mg, Na, SAR, and hardness.	Each	$56.80	1	$56.80
Test, singular specialized water test, well water	2003	Testing for specific pesticide, inorganic chemical or volatile organic not included in a basic well suitability test. Includes materials and shipping only.	Each	$210.57	1	$210.57

Practice: 356 - Dike and Levee

Scenario: #1 - Dike

Scenario Description:
Construction a barrier of either earth or manufatcured materials for the purpose of the protetion of people or property from floods or to control water levels in connection with crop production; fish and wildlife management; or wetland maintenance, improvement, restoration, or construction. Embankment structure to provide adequate freeboard, allowance for settlement, and foundation and embankment stability.

Before Situation:
Site is subject to flooding or indundation which poses a potential hazard to public safety, damage to land or property. Site may also require control of water level for purposes connected with crop production; fish and wildlife managment; or wetland maintenance, improvement, restoration, or construction. An adequate quantity of soil suitable for constructing an earthen dike is available at an economical haul distance.

After Situation:
Water level is controlled by a stable earthen structure installed with compacted fill material. Material haul < 1 mile. Typical earthen dike assumed 1000 lineal feet, Class II (6 ft. in height, 8 ft. top width, 2H:1V side slopes). Potential hazard to public safety, land or property mitigated; environmental benefit provided. Scenario includes component for stripping and stockpiling base of dike. Associated practices include, but are not limited to: PS327 Conservation Cover, PS656 Constructed Wetland, PS342 Critical Area Planting, PS378 Ponds, PS382 Fence, PS464 Irrigation Land Levelling, PS500 Obstruction Removal, PS528 Prescribed Grazing, PS587 Structure for Water Control, PS620 Underground Outlet, PS645 Upland Wildlife Management, PS658 Wetland Creation, PS659 Wetland Enhancement, PS657 Wetland Restoration, PS644 Wetland Wildlife Habitat Management.

Feature Measure: Cubic Yards of Earthmoving

Scenario Unit: Cubic Yards

Scenario Typical Size: 4,444.00

Scenario Total Cost: $21,474.03

Scenario Cost/Unit: $4.83

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	5036	$20,194.36
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yards	$0.87	592	$515.04
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 359 - Waste Treatment Lagoon

Scenario: #13 - Waste Treatment Lagoon

Scenario Description:

A waste treatment lagoon is a component of a waste management system that provides biological treatment of manure and other byproducts of animal agricultural operations by reducing the pollution potential. Resource concern addressed is water quality by reducing the pollution potential to surface and groundwater by treating and storing liquid waste. Earthen lagoon liners are addressed with another standard. This scenario intended for embankment or excavated lagoon.Potential Associated Practices: Pond Sealing or Lining, Compacted Soil (520), Pond Sealing or Lining, Concrete (522), Pond Sealing or Lining, Geomembrane or Geosynthetic Clay Liner (521), Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), and Waste Separation Facility (632).

Before Situation:

Operator presently has a confined animal feeding operation without a waste management system adequate to handle the waste stream leaving the animal production facilities. Manure and other agricultural waste by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or are being transported but not properly utilized or disposed. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources.

After Situation:

A waste treatment lagoon constructed from on-site material provides an environmentally safe facility for storing manure and other agricultural waste by-products. This facility provides the landowner a means of storing and treating waste until it can be utilized in a proper manner in accordance with a nutrient management plan. Excavated material used to build an embankment around the lagoon so this is a combination excavated/embankment design.Typical design size : Design Volume 492,129 cf = 18,227 cy; 260' X 208' (top); 3:1 inside and outside side slopes; cut/fill ratio = 1.25; total depth = 13' which includes 1' freeboard Feature Measure = Design Volume [Operational Volume + emergency volume + freeboard]

Feature Measure: Design Volume (Operational + eme

Scenario Unit: Cubic Feet

Scenario Typical Size: 492,129.00

Scenario Total Cost: $100,867.27

Scenario Cost/Unit: $0.20

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	9102	$36,499.02
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.45	8101	$27,948.45
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yards	$0.87	1389	$1,208.43
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yards	$3.67	9125	$33,488.75
Materials						
Structural steel tubing, 2 in. diameter	1120	Structural steel tubing, 2 inch diameter, 1/8 inch wall thickness, materials only	Feet	$4.35	8	$34.80
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 360 - Waste Facility Closure

Scenario: #1 - Closure of Liquid Waste Impoundment disposal onsite

Scenario Description:

This practice scenario includes the decommissioning of a liquid waste facility. The purpose of the practice is to address resource concerns related to water quality degradation due to excess nutrient and pathogens in ground and/or surface waters and air quality impacts from greenhouse gases, particulate matter and associated precursors, and objectionable odors.Associated practices: Nutrient Management (590), Critical Area Planting (342)

Before Situation:

An existing lagoon or waste storage pond is no longer functioning correctly or is not being used for its intended purpose. It poses a safety hazard for humans and livestock and is a threat to environmentally sustainability by the potential for impacts to water and air quality.

After Situation:

This scenario assumes a waste storage pond, with top dimensions of 110 ft x 110 ft, 8 ft total depth with 2:1 side slopes. The total structural storage volume equals 71,371 cubic feet. The volume of earthwork (earthfill and excavation) required to breach the embankment is assumed to be 1/4 of the embankment length. The embankment is assumed to be 2:1 inside and 3:1 outside side slopes with a 12' top width and an average height of 8'. The fill needed for final grading of the site is approximately 75% of the structural volume. Structural removal, as necessary, includes the partial removal and disposal on site of the concrete liner, sealing or removal and disposal of waste transfer components and other appurtenances associated with closure of the facility. The volume of concrete to be removed is determined as follows: The entire section of the embankment that is removed will need the concrete removed as well. For the rest of the storage, the liner will be perforated by removing 0.7 cy of concrete will need to be removed for every 50 ft^2 that is existing. Decommissioning of a liquid waste storage impoundment includes agitating, removing, and spreading liquid/slurry waste material, removing solid/sludge waste remaining in the bottom. All waste material shall be land applied in accordance with Nutrient Management (590). Removal of waste is not part of the payment. If present, the synthetic liner will be removed and properly disposed of. All inflow devices and associated appurtenances will be removed and properly disposed of. The embankment will be breached and the excavation filled in with the embankment material or hauled in earthfill. The disturbed areas shall be vegetated in accordance with Critical Area Planting (342). Closure of the waste impoundment will address water quality degradation, air quality impacts and safety hazards by removing and properly utilizing the waste from the impoundment. The site will also become available for another use.

Feature Measure: Cubic feet of structural storage

Scenario Unit: Cubic Feet

Scenario Typical Size: 71,371.00

Scenario Total Cost: $18,242.03

Scenario Cost/Unit: $0.26

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	1284	$3,235.68
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	1983	$7,951.83
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	12	$1,566.12
Demolition, concrete	1498	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yards	$11.57	191	$2,209.87
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	12	$344.52
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	12	$481.56
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 360 - Waste Facility Closure

Scenario: #4 - Closure of Liquid Waste Impoundment disposal offsite

Scenario Description:

This practice scenario includes the decommissioning of a liquid waste facility. The purpose of the practice is to address resource concerns related to water quality degradation due to excess nutrient and pathogens in ground and/or surface waters and air quality impacts from greenhouse gases, particulate matter and associated precursors, and objectionable odors.Associated practices: Nutrient Management (590), Critical Area Planting (342)

Before Situation:

An existing lagoon or waste storage pond is no longer functioning correctly or is not being used for its intended purpose. It poses a safety hazard for humans and livestock and is a threat to environmentally sustainability by the potential for impacts to water and air quality.

After Situation:

This scenario assumes a waste storage pond, with top dimensions of 110 ft x 110 ft, 8 ft total depth with 2:1 side slopes. The total structural storage volume equals 71,371 cubic feet. The volume of earthwork (earthfill and excavation) required to breach the embankment is assumed to be 1/4 of the embankment length. The embankment is assumed to be 2:1 inside and 3:1 outside side slopes with a 12' top width and an average height of 8'. The fill needed for final grading of the site is approximately 75% of the structural volume. Structural removal, as necessary, includes the complete removal and disposal off site of the concrete liner, sealing or removal and disposal of waste transfer components and other appurtenances associated with closure of the facility. Concrete disposal offsite in landfill. Decommissioning of a liquid waste storage impoundment includes agitating, removing, and spreading liquid/slurry waste material, removing solid/sludge waste remaining in the bottom. All waste material shall be land applied in accordance with Nutrient Management (590). Removal of waste is not part of the payment. If present, the synthetic liner will be removed and properly disposed of. All inflow devices and associated appurtenances will be removed and properly disposed of. The embankment will be breached and the excavation filled in with the embankment material or hauled in earthfill. The disturbed areas shall be vegetated in accordance with Critical Area Planting (342). Closure of the waste impoundment will address water quality degradation, air quality impacts and safety hazards by removing and properly utilizing the waste from the impoundment. The site will also become available for another use.

Feature Measure: Cubic feet of structural storage

Scenario Unit: Cubic Feet

Scenario Typical Size: 71,371.00

Scenario Total Cost: $25,533.62

Scenario Cost/Unit: $0.36

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	1284	$3,235.68
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	1983	$7,951.83
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	22	$2,871.22
Demolition, concrete	1498	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yards	$11.57	209	$2,418.13
Hauling, bulk, highway truck	1615	Hauling of bulk earthfill, rockfill, waste or debris. One-way travel distance using fully loaded highway dump trucks (typically 16 CY or 20 TN capacity). Includes equipment and labor for truck only. Does not include cost for loading truck.	Cubic Yard Mile	$0.36	8360	$3,009.60
Front End Loader, 185 HP	1619	Wheeled front end loader with horsepower range of 160 to 210. Equipment and power unit costs. Labor not included.	Hours	$104.50	8	$836.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	22	$631.62
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	30	$1,203.90
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	2	$1,846.38

Practice: 360 - Waste Facility Closure

Scenario: #15 - Closure of Underbarn Liquid Waste Impoundment w/concrete liner

Scenario Description:

'This practice scenario includes the decommissioning of a waste storage facility which is located under an existing building which is going to stay after the structure is closed. The purpose of the practice is to address resource concerns related to water quality degradation due to excess nutrient and pathogens in ground and/or surface waters and air quality impacts from greenhouse gases, particulate matter and associated precursors, and objectionable odors.Associated practices: Nutrient Management (590).'

Before Situation:

An existing underbarn waste impoundment is no longer functioning correctly or is not being used for its intended purpose. It poses a safety hazard for humans and livestock and is a threat to environmentally sustainability by the potential for impacts to water and air quality.

After Situation:

This scenario assumes a waste storage facility, which is located under a building, with top dimensions of 40 ft x 60 ft, 8 ft total depth with verticle walls. The total structural storage volume equals 19,200 cubic feet. The majority of the walls will remain in place, but a 15' section of wall will be removed as well as breaking up 4, 4'x4' holes to inspect for contamination and removing the beams and slats on the top of the structure. The rest of the floor is broken up, but doesn't need to be removed. The structure is then fill with material. Decommissioning of a liquid waste storage impoundment includes agitating, removing, and spreading liquid/slurry waste material, removing solid/sludge waste remaining in the bottom. All waste material shall be land applied in accordance with Nutrient Management (590). Removal of waste is not part of the payment. All inflow devices and associated appurtenances will be removed and properly disposed of. Closure of the waste impoundment will address water quality degradation, air quality impacts and safety hazards by removing and properly utilizing the waste from the impoundment. The site will also become available for another use.

Feature Measure: Cubic feet of total storage

Scenario Unit: Cubic Feet

Scenario Typical Size: 19,200.00

Scenario Total Cost: $22,237.44

Scenario Cost/Unit: $1.16

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	332	$836.64
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	32	$4,176.32
Demolition, concrete	1498	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yards	$11.57	5	$57.85
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	40	$1,148.40
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	32	$1,284.16
Materials						
Earthfill Material, purchased, common	2060	Purchased earthfill materials includes both silt or clay. Material only.	Cubic Yards	$19.62	712	$13,969.44
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 360 - Waste Facility Closure

Scenario: #21 - Removal WSF liner, repurposed for clean water basin

Scenario Description:

This practice scenario includes the rehabilitating of an earthen waste impoundment (embankment or excavated type) that is being repurposed for a clean water purpose. Includes removal of the earthen liner, ramp and contaminated soil in preparation for reusing as a clean water basin. The purpose of the practice is to address resource concerns related to water quality degradation due to excess nutrient and pathogens in ground and/or surface waters and air quality impacts from greenhouse gases, particulate matter and associated precursors, and objectionable odors. Potential Associated Practices: Critical Area Planting (342), Nutirent Management (590)

Before Situation:

Operator presently has a waste management system that has been evaluated and determined to be inadequate and no longer being used for its intended purpose. This situation poses an environmentally threat of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. It is also a safety hazard for humans and livestock and is a threat to environmentally sustainability by the potential for impacts to water and air quality.

After Situation:

This scenario assumes a waste storage pond, with top dimensions of 110 ft x 110 ft, 8 ft total depth with 2:1 side slopes. The total structural storage volume (design storage Volume) equals 71,371 cubic feet; design operating(storage) volume is 56,097 cubic feet. The volume of earthwork (earthfill and excavation) required to remove the contaminated soil is 1 foot on all surfaces. Structural removal, as necessary, may include the removal and disposal of the non-functioning liner (if applicable), sealing or removal and disposal of waste transfer components and other appurtenances associated with rehabilitation of the facility. The rehabilitation of a liquid waste storage impoundment includes agitating, removing, and spreading liquid/slurry waste material, removing solid/sludge waste remaining in the bottom. All waste material will be land applied in accordance with Nutrient Management (590). Removal of waste is not part of the payment. If present, the synthetic liner will be removed and properly disposed of. All inflow devices and associated appurtenances will be removed and properly disposed of.Rehabilitation of the waste impoundment will address water quality degradation, air quality impacts and safety hazards by removing and properly utilizing the waste from the impoundment. The site will become a new storm water basin and no longer pose a resource concern.

Feature Measure: Design Storage Volume

Scenario Unit: Cubic Feet

Scenario Typical Size: 71,371.00

Scenario Total Cost: $4,024.43

Scenario Cost/Unit: $0.06

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	481	$1,212.12
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	12	$1,566.12
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	12	$481.56
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 360 - Waste Facility Closure

Scenario: #34 - Demolition of Concrete Waste Storage Structure

Scenario Description:

This practice scenario includes the demolition of a concrete waste storage structure. The purpose of the practice is to address resource concerns related to water quality degradation due to excess nutrient and pathogens in ground and/or surface waters and air quality impacts from greenhouse gases, particulate matter and associated precursors, and objectionable odors.Associated practices: Nutrient Management (590), Critical Area Planting (342)

Before Situation:

An existing concrete waste storage structure is no longer functioning correctly or is not being used for its intended purpose. It poses a safety hazard for humans and livestock and is a threat to environmentally sustainability by the potential for impacts to water and air quality.

After Situation:

This scenario assumes a concrete waste storage structure, with top dimensions of 60 ft x 60 ft with 10 ft vertical walls. The walls are 8 inches thick, the concrete floor is 5 inches thick and the footing for the wall is 12 inches wide by 24 inches deep. The total structural storage volume equals 36,000 cubic feet. The total volume of concrete to be demolished is 3,580 cubic feet ([2 X (60 ft + 60 ft) X 8in /12 in/ft] + [60 ft X 60 ft X 5in /12 in/ft] + [2 X (60 ft + 60 ft) X 12in /12 in/ft X 24in /12in/ft]). The volume of waste to be removed approximately equals 50% of the structural volume (50% X 36,000 = 18,000 CF). The volume of earthwork (earthfill and/or excavation, final grading) required is approximately 50% of the structural volume. The concrete will be demolished and hauled off-site for recycling or disposal. Structural removal, as necessary, may include the sealing or removal and disposal of waste transfer components and other appurtenances associated with closure of the facility. Demolition of a concrete waste storage structure includes agitating, removing, and spreading the waste remaining in the structure. All waste material shall be land applied in accordance with Nutrient Management (590). Excavated areas will be filled in. The disturbed areas shall be vegetated in accordance with Critical Area Planting (342). Demolition of the concrete waste structure will address water quality degradation, air quality impacts and safety hazards by removing and properly utilizing the waste from the impoundment. The site will also become available for another use.

Feature Measure: Cubic Feet of concrete to be demoli

Scenario Unit: Cubic Feet

Scenario Typical Size: 3,580.00

Scenario Total Cost: $13,360.29

Scenario Cost/Unit: $3.73

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	667	$2,674.67
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	10	$1,305.10
Manure, compost, injection	956	Loading, hauling and injecting manure/compost by ground equipment. Includes equipment, power unit and labor costs.	Gallons	$0.02	134640	$2,692.80
Demolition, concrete	1498	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yards	$11.57	133	$1,538.81
Hauling, bulk, highway truck	1615	Hauling of bulk earthfill, rockfill, waste or debris. One-way travel distance using fully loaded highway dump trucks (typically 16 CY or 20 TN capacity). Includes equipment and labor for truck only. Does not include cost for loading truck.	Cubic Yard Mile	$0.36	1330	$478.80
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	10	$287.10
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	10	$401.30
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	4	$3,058.52
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 360 - Waste Facility Closure

Scenario: #35 - Closure of Fabricated Waste Storage Facility

Scenario Description:

This practice scenario includes the decommissioning of a fabricated waste storage facility. The storage structure is no longer functioning as intended, exceeded its design life and is a hazard to humans and livestock. The practice purpose is to address resource concerns related to water quality degradation due to excess nutrient and pathogens in groundwater and/or surface waters and air quality impacts from greenhouse gasses, particulate matter and associated precursors that result in objectionable odors. Decommissioning of the fabricated waste storage facility does NOT include agitating, removing, and spreading of the liquid/slurry waste material. Additional associated practices may include: Nutrient Management (590), Critical Area Planting (342)

Before Situation:

An existing fabricated waste storage facility is no longer functioning correctly or is not being used for its intended purpose. It poses a safety hazard for humans and livestock and is a threat to environmentally sustainability by the potential for impacts to water and air quality.

After Situation:

A fabricated waste storage facility is disassembled and loaded onto a trailer for transport, the concrete foundation remains in place, and all waste transfer components are disconnected. Typical is a vertical steel structure that is 62 ft in diameter x 28 ft tall with a total storage capacity of 84,534 cf. The reinforced concrete footings and base will remain in place and are not included as part of the closure payment. Steel panels are disassembled with needed labor and equipment to complete the job. The steel panels are loaded onto a semi-trailer to be moved off site, transporting the panels off-site is not included as part of this scenario payment. All transfer components are disconnected and rendered inoperable but are not removed from the site. All liquid/slurry waste are to be land applied in accordance with Nutrient Management (590). Revegetate disturbed areas as appropriate to the site conditions in accordance with Critical Area Planting (342). Closure of the fabricated waste storage facility addresses the safety hazards and threat to water and air quality.

Feature Measure: Cubic Feet of Total Storage

Scenario Unit: Cubic Feet

Scenario Typical Size: 84,534.00

Scenario Total Cost: $15,347.65

Scenario Cost/Unit: $0.18

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$56.88	40	$2,275.20
Trailer, flatbed, large	1504	Large flatbed trailer (typically 30' to 50' in length) pulled by a semi truck to transport materials and equipment. Truck not included.	Hours	$19.93	40	$797.20
Aerial lift, telescoping bucket	1893	Aerial lift, bucket truck or cherry picker, typical 40' boom. Equipment only.	Hours	$45.71	40	$1,828.40
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	160	$4,593.60
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	80	$2,428.80
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	20	$972.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 362 - Diversion

Scenario: #1 - Earthen

Scenario Description:

An earthen channel constructed across long slopes with supporting ridge on lower side, to divert runoff away from farmsteads, agricultural waste systems, gullies, critical erosion areas, construction areas or other sensitive areas. Outlet may be waterway, underground outlet. or other suitable outlet. Typical diversion is, 600 feet long installed on a field slope of 5 percent and requires 1 CY excavation per LF. Channel my be level or gradient and ridge may be vegetated or farmed. The quantity of excavation and fill is balanced. The earthfill in the diversion is compacted with a dozer.

Before Situation:

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds 'T' from farm fields and other locations. Also, roof runoff or surface runoff that becomes contaminated with agricultral wastes that significantly contributes to the amount of runoff that has to be stored or treated.

After Situation:

Diversion is 600 feet long installed using a dozer. Field system meets 'T' or 'clean' storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultral waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Underground Outlet (620), Mulching (484), and Subsurface Drainage (606).

Feature Measure: Length of Diversion

Scenario Unit: Feet

Scenario Typical Size: 600.00

Scenario Total Cost: $4,972.35

Scenario Cost/Unit: $8.29

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	600	$1,512.00
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$100.26	13	$1,303.38
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	2	$57.42
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	13	$521.69
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	1	$48.60
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 362 - Diversion

Scenario: #2 - Reinforced Concrete Curb With Footer

Scenario Description:

A reinforced concrete (RC) curb constructed across the slope to divert runoff away from farmsteads, gullies, critical erosion areas, construction areas, agricultural waste system, other sensitive areas, or to a waste storage facility. Outlet may be a waterway, underground outlet, or other suitable outlet. Typical 1.0 ft. high, 6 inch thick RC curb diversion is approximately 50 feet long with a 2.0 ft wide footing and requires approximately 0.056 CY of RC per linear ft. The curb will be placed on 6' of compacted sand.

Before Situation:

Excessive roof runoff or surface runoff that becomes contaminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated. Also, contaminated lot runoff that needs to be diverted to a waste storage facility so it doesn't pollute surface water or ground water.

After Situation:

The 1.0 ft. high, 6 inch thick RC curb diversion is approximately 50 feet long. 'Clean' storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Polluted water is diverted to a waste storage facility for proper storage. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Underground Outlet (620), Mulching (484), and Waste Storage Facility (313).

Feature Measure: Length of concrete diversion

Scenario Unit: Feet

Scenario Typical Size: 50.00

Scenario Total Cost: $2,045.23

Scenario Cost/Unit: $40.90

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	2.8	$1,587.82
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	3.7	$9.32
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	2.15	$13.44
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	1	$28.71
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	1	$48.60
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	1.85	$53.39
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 362 - Diversion

Scenario: #3 - Reinforced Concrete Curb, Doweled into Slab

Scenario Description:
A concrete curb 12' high and 6' wide formed on and doweled to an existing concrete slab. The purpose is to divert runoff from a feedlot to a storage or treatment area to protect water quality. Typical diversion is, 100 feet long installed on concrete feedlot, 0.02 CY of concrete per LF.

Before Situation:
Manure laden runoff flows over the lower end of a concrete feedlot and causes a water quality problem below the lot. Also, roof runoff or surface runoff that becomes contaminated with agricultral wastes that significantly contributes to the amount of runoff that has to be stored or treated.

After Situation:
Diversion is installed using small tools and general labor. Contaminated storm water runoff is diverted away from a discharge point to a storage or treatment area. Associated practices are Waste Storage Facility(313), Vegetated Treatment Area(635), Underground Outlet (620).

Feature Measure: Linear Feet

Scenario Unit: Feet

Scenario Typical Size: 100.00

Scenario Total Cost: $1,444.22

Scenario Cost/Unit: $14.44

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	2	$1,002.50
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	12	$344.52
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	2	$97.20

Practice: 362 - Diversion

Scenario: #4 - Reinforced Concrete Channel, Flat Slab

Scenario Description:
A concrete channel constructed across a slope, to divert runoff away from farmsteads and agricultural waste systems. Outlet may be waterway, underground outlet. or other suitable outlet. Typical diversion is, 100 feet long x 15' wide and 1 feet deep. Concrete may be 6' thick to accomodate expected equipment loads and will be driven across with heavy equipment.

Before Situation:
Roof runoff or surface runoff that becomes contaminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.

After Situation:
Diversion is 100 feet long installed using a dozer and general labor for concrete forming. Clean storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultral waste. Associated practices are Grassed Waterway (412), Underground Outlet (620), Mulching (484), and Subsurface Drainage (606).

Feature Measure: Length of diversion

Scenario Unit: Feet

Scenario Typical Size: 100.00

Scenario Total Cost: $15,298.22

Scenario Cost/Unit: $152.98

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	28	$14,035.00
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	60	$151.20
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	28	$808.08
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 362 - Diversion

Scenario: #16 - Diversion

Scenario Description:

An earthen channel constructed across long slopes with supporting ridge on lower side, to divert runoff away from farmsteads, agricultural waste systems, gullies, critical erosion areas, construction areas or other sensitive areas. Outlet may be waterway, underground outlet. or other suitable outlet. Typical diversion is, 1000 feet long installed on a field slope of 5 percent and requires 1 CY excavation per LF. Channel my be level or gradient and ridge may be vegetated or farmed. The quantity of excavation and fill is balanced.

Before Situation:

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds 'T' from farm fields and other locations. Also, roof runoff or surface runoff that becomes contaminated with agricultral wastes that significantly contributes to the amount of runoff that has to be stored or treated.

After Situation:

Diversion is 1000 feet long installed using a dozer. Field system meets 'T' or 'clean' storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultral waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Underground Outlet (620), Mulching (484), and Subsurface Drainage (606).

Feature Measure: Length of Diversion

Scenario Unit: Feet

Scenario Typical Size: 1,000.00

Scenario Total Cost: $3,439.25

Scenario Cost/Unit: $3.44

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	1000	$2,520.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	2	$57.42
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	2	$97.20
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 366 - Anaerobic Digester

Scenario: #1 - Anaerobic Digester

Scenario Description:

An anaerobic digester can be part of a waste management system. It provides biological treatment of the waste in the absence of oxygen. This process for manure and other by-products of animal agricultural operations will manage odors, reduce the net effect of greenhouse gas emissions, and/or reduce pathogens. This scenario is for a generic anaerobic digester. Energy generation is not included with this scenario.Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Waste Separation Facility (632), Waste Treatment Lagoon (359), and Waste Storage Facility (313).

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and ground waters, in addition to the use of excessive amounts of fertilizers. The treatment of manure and other agricultural by-products is desired in order to manage odors, and/or reduce pathogens.

After Situation:

Manure and other agricultural by-products are being treated such that odors are managed and/or pathogens are reduced. Effluent from the digester is disposed of or utilized in a proper manner in accordance with a nutrient management plan. The typical scenario also includes items necessary to maintain mesophylic or thermophylic temperatures for bacterial activity (i.e. piping and boiler or other heat source). Typical Design Scenario is each.

Feature Measure: Each

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $1,911,702.68

Scenario Cost/Unit: $1,911,702.68

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.39	2	$232.78
Equipment Installation						
Anaerobic Digester	2478	Concrete anaerobic digester which includes poured walls, floor and top, reception and mixing tanks, piping installed in and/or around the digester for circulating heated liquid to maintain the necessary temperatures for efficient digester operation, piping and collection system for biogas, controls for operating digester and boiler system, boiler needed to maintain digester temperature, and flare excess gas to convert from methane to carbon dioxide. Includes material, labor, and equipment.	Each	$1,909,600.00	1	$1,909,600.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 367 - Roofs and Covers

Scenario: #1 - Hoop frame and flexible Roof

Scenario Description:
A flexible membrane or fabric-like roof placed on a steel truss hoop-like supports and supporting foundation. Manure is stored as a liquid in basins, tanks, and stacking slabs as well as building up on feedlot surfaces. Excess precipitation can cause premature filling of storages or cause nutrient laden runoff as well as odor issues.

Associated practices include Waste Storage Facility (313), Animal Mortality Facility (316), Composting Facility (317), Roof Runoff Structure (558), and Waste Treatment (629).

Before Situation:
Applicable where the exclusion of precipitation from; 1) an animal waste storage and/or treatment facility will improve of an existing or planned system or, 2) a feedlot will minimize nutrient laden runoff.

After Situation:
A flexible membrane or fabric-like roof placed on a steel truss hoop-like supports and supporting foundation. Roof or cover will be engineered and installed in accordance with appropriate building codes and permits. Typical size is 1,000 square feet and is over an approved animal waste management facility or feedlot as a component of a CNMP. It is designed to exclude precipitation to allow proper management of animal waste streams (manure or compost streams), thus mitigating the negative factors from the 'before practice implementation'.

Feature Measure: Footprint of the building

Scenario Unit: Square Feet

Scenario Typical Size: 1,000.00

Scenario Total Cost: $36,172.61

Scenario Cost/Unit: $36.17

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	33	$18,713.64
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hours	$9.89	8	$79.12
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$75.12	8	$600.96
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	8	$242.88
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	34	$3,789.30
Materials						
Roof, Hoop Truss Arch Structure, less than 30 ft. wide	1667	Hoop Truss Arch Structure with fabric cover - less than 30 ft. width, includes materials, equipment, and installation. Does not include foundation preparation.	Square Feet	$11.80	1000	$11,800.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 367 - Roofs and Covers

Scenario: #2 - Roof Structure, Less Than 30 Ft Wide

Scenario Description:

A roof structure with a timber or steel 'sheet' roof and supporting foundation. Manure is stored as a liquid in basins, tanks, and stacking slabs as well as building up on feedlot surfaces. Excess precipitation can cause premature filling of storages or cause nutrient laden runoff as well as odor issues. Specialized labor included for design and construction certification.Associated practices include Waste Storage Facility (313), Animal Mortality Facility (316), Composting Facility (317), Agrichemical Handling Facility (309), Roof Runoff Structure (558), and Waste Treatment (629).

Before Situation:

Applicable where the exclusion of precipitation from; 1) an animal waste storage and/or treatment facility will improve of an existing or planned system or, 2) a feedlot will minimize nutrient laden runoff.

After Situation:

A roof structure with a timber or steel 'sheet' roof and supporting foundation. Typical size is 1000 square feet and is over an approved animal waste management facility or feedlot as a component of a CNMP. It is designed to exclude precipitation to allow proper management of animal waste streams (manure or compost streams), thus mitigating the negative factors from the 'before practice implementation'.

Feature Measure: Roof Area

Scenario Unit: Square Feet

Scenario Typical Size: 1,000.00

Scenario Total Cost: $22,871.29

Scenario Cost/Unit: $22.87

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	50	$5,572.50
Materials						
Roof, Post Frame Building , less than 30 ft. wide	1672	Post Frame Building, no sides, - less than 30 ft. width. Building sites with expected snow loads up to 30 lbs. per square foot and wind exposure in semi protected areas (wooded or terrain with numerous closely spaced obstructions). Includes materials, shipping, equipment, and installation. Does not include foundation preparation.	Square Feet	$16.17	1000	$16,170.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	2	$364.16
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 367 - Roofs and Covers

Scenario: #3 - Roof Structure, 30 ft to 60 ft Wide

Scenario Description:
A roof structure with a timber or steel 'sheet' roof and supporting foundation. Manure is stored as a liquid in basins, tanks, and stacking slabs as well as building up on feedlot surfaces. Excess precipitation can cause premature filling of storages or cause nutrient laden runoff as well as odor issues. Specialized labor included for design.Associated practices include Waste Storage Facility (313), Animal Mortality Facility (316), Composting Facility (317), Agrichemical Handling Facility (309), Roof Runoff Structure (558), and Waste Treatment (629).

Before Situation:
Applicable where the exclusion of precipitation from; 1) an animal waste storage and/or treatment facility will improve of an existing or planned system or, 2) a feedlot will minimize nutrient laden runoff.

After Situation:
A roof structure with a timber or steel 'sheet' roof and supporting foundation. Typical size is 40'x60' (2400 square feet) and is over an approved animal waste management facility or feedlot as a component of a CNMP. It is designed to exclude precipitation to allow proper management of animal waste streams (manure or compost streams), thus mitigating the negative factors from the 'before practice implementation'.

Feature Measure: Roof Area

Scenario Unit: Square Feet

Scenario Typical Size: 2,400.00

Scenario Total Cost: $41,741.29

Scenario Cost/Unit: $17.39

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	50	$5,572.50
Materials						
Roof, Post Frame Building, 30 to 60 ft. wide	1676	Post Frame Building, no sides, - 30 to 60 ft. width. Building sites with expected snow loads up to 30 lbs. per square foot and wind exposure in semi protected areas (wooded or terrain with numerous closely spaced obstructions). Includes materials, shipping, equipment, and installation. Does not include foundation preparation.	Square Feet	$14.60	2400	$35,040.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	2	$364.16
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 367 - Roofs and Covers

Scenario: #4 - Roof Structure, Greater Than 60 ft Wide

Scenario Description:

A roof structure with a timber or steel 'sheet' roof and supporting foundation. Manure is stored as a liquid in basins, tanks, and stacking slabs as well as building up on feedlot surfaces. Excess precipitation can cause premature filling of storages or cause nutrient laden runoff as well as odor issues. Labor for design is included.Associated practices include Waste Storage Facility (313), Animal Mortality Facility (316), Composting Facility (317), Agrichemical Handling Facility (309), Roof Runoff Structure (558), and Waste Treatment (629).

Before Situation:

Applicable where the exclusion of precipitation from; 1) an animal waste storage and/or treatment facility will improve of an existing or planned system or, 2) a feedlot will minimize nutrient laden runoff.

After Situation:

A roof structure with a timber or steel 'sheet' roof and supporting foundation. Typical size is 80'x120' (9600 square feet) and is over an approved animal waste management facility or feedlot as a component of a CNMP. It is designed to exclude precipitation to allow proper management of animal waste streams (manure or compost streams), thus mitigating the negative factors from the 'before practice implementation'.

Feature Measure: Roof Area

Scenario Unit: Square Feet

Scenario Typical Size: 9,600.00

Scenario Total Cost: $140,621.29

Scenario Cost/Unit: $14.65

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	50	$5,572.50
Materials						
Roof, Post Frame Building, greater than 60 ft. wide	1673	Post Frame Building, no sides, - greater than 60 ft. width. Building sites with expected snow loads up to 30 lbs. per square foot and wind exposure in semi protected areas (wooded or terrain with numerous closely spaced obstructions). Includes materials, shipping, equipment, and installation. Does not include foundation preparation.	Square Feet	$13.95	9600	$133,920.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	2	$364.16
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 367 - Roofs and Covers

Scenario: #8 - Bin Roof

Scenario Description:
A timber framed, metal roofed, roof structure with posts mounted on top of the concrete walls, or integral with timber walls of an Animal Mortality Compost Bin facility or other conservation practices that would need an open faced roof structure.Associated practices includes Animal Mortality Facility (316), Agrichemical Handling Facility (319), and Roof Runoff Structure (558).

Before Situation:
Applicable where it is determined that eliminating excess moisture from precipitation will enhance the composting operation. Excess moisture can retard the microbial composting activity and cause odors and excess seepage.

After Situation:
A timber framed building with a steel 'sheet' roof, without sides, mounted on top of the concrete walls, or integral with timber walls of an Animal Mortality Compost Static Pile, Bin system, or a dry agrichemical storage facility. Engineered and installed in accordance with appropriate building codes and permits. Typical roof size is 1,268 square feet over a MN Standard Drawing MN-ENG-616 composting structure with 5 bins.

Feature Measure: Roof Area

Scenario Unit: Square Feet

Scenario Typical Size: 1,268.00

Scenario Total Cost: $9,873.61

Scenario Cost/Unit: $7.79

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	80	$3,509.60
Materials						
Corrugated Steel, 28 gauge	223	Corrugated or ribbed, galvanized, 28 gauge, includes fasteners, materials only.	Square Feet	$1.53	1268	$1,940.04
Dimension Lumber, untreated	1045	Untreated dimension lumber with nominal thickness equal or less than 2 inches. Includes lumber and fasteners.	Board Feet	$2.10	1255.33	$2,636.19
Lumber, planks, posts and timbers, treated	1609	Treated dimension lumber with nominal thickness greater than 2 inches. Includes lumber and fasteners. Does not include labor.	Board Feet	$3.53	368.77	$1,301.76
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 367 - Roofs and Covers

Scenario: #14 - Roof Structure, 30 ft to 60 ft Wide, High Snow Load

Scenario Description:

A roof structure designed for high snow and wind loads with a timber or steel 'sheet' roof and supporting foundation. For roof snow loads greater than 30 psf. Manure is stored as a liquid in basins, tanks, and stacking slabs as well as building up on feedlot surfaces. Excess precipitation can cause premature filling of storages or cause nutrient laden runoff as well as odor issues. Specialized labor added for designAssociated practices include Waste Storage Facility (313), Animal Mortality Facility (316), Composting Facility (317), Agrichemical Handling Facility (309), Roof Runoff Structure (558), and Waste Treatment (629).

Before Situation:

Applicable where the exclusion of precipitation from; 1) an animal waste storage and/or treatment facility will improve of an existing or planned system or, 2) a feedlot will minimize nutrient laden runoff.

After Situation:

A roof structure designed for high snow and wind loads with a timber or steel 'sheet' roof and supporting foundation. Typical size is 40'x60' (2400 square feet) and is over an approved animal waste management facility or feedlot as a component of a CNMP. Designed with a roof snow load greater than 30 psf. It is designed to exclude precipitation to allow proper management of animal waste streams (manure or compost streams), thus mitigating the negative factors from the 'before practice implementation'.

Feature Measure: Roff Area

Scenario Unit: Square Feet

Scenario Typical Size: 2,400.00

Scenario Total Cost: $47,961.16

Scenario Cost/Unit: $19.98

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	2	$60.72
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	50	$5,572.50
Materials						
Roof, Post Frame Building, 30 to 60 ft. Wide, Hazardous Condtions	2512	Post Frame Building, no sides, - between 30 and 60 ft. width. Hazardous building sites with snow loads exceeding 30 lbs. per square foot and extreme wind exposure in areas of open terrain (flat open areas, grassland, shoreline, etc.). Includes materials, shipping, equipment, and installation. Does not include foundation preparation.	Square Feet	$17.51	2400	$42,024.00
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 367 - Roofs and Covers

Scenario: #15 - Roof Structure, Greater Than 60 ft Wide, High Snow Load

Scenario Description:

A roof structure designed for high snow and wind loads with a timber or steel 'sheet' roof and supporting foundation. For roof snow loads greater than 30 psf. Manure is stored as a liquid in basins, tanks, and stacking slabs as well as building up on feedlot surfaces. Excess precipitation can cause premature filling of storages or cause nutrient laden runoff as well as odor issues. With specialized labor for designAssociated practices include Waste Storage Facility (313), Animal Mortality Facility (316), Composting Facility (317), Agrichemical Handling Facility (309), Roof Runoff Structure (558), and Waste Treatment (629).

Before Situation:

Applicable where the exclusion of precipitation from; 1) an animal waste storage and/or treatment facility will improve of an existing or planned system or, 2) a feedlot will minimize nutrient laden runoff.

After Situation:

A roof structure designed for high snow and wind loads with a timber or steel 'sheet' roof and supporting foundation. Typical size is 80'x120' (9600 square feet) and is over an approved animal waste management facility or feedlot as a component of a CNMP. Designed for roof snow loads greater than 30 psf. It is designed to exclude precipitation to allow proper management of animal waste streams (manure or compost streams), thus mitigating the negative factors from the 'before practice implementation'.

Feature Measure: Roof Area

Scenario Unit: Square Feet

Scenario Typical Size: 9,600.00

Scenario Total Cost: $161,391.52

Scenario Cost/Unit: $16.81

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	3	$91.08
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	50	$5,572.50
Materials						
Roof, Post Frame Building, Greater Than 60 ft. Wide, Hazardous Condtions	2513	Post Frame Building, no sides, - greater than 60 ft. width. Hazardous building sites with snow loads exceeding 30 lbs. per square foot and extreme wind exposure in areas of open terrain (flat open areas, grassland, shoreline, etc.). Includes materials, shipping, equipment, and installation. Does not include foundation preparation.	Square Feet	$16.19	9600	$155,424.00
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 367 - Roofs and Covers

Scenario: #17 - Enclosed Building for Agrichemical Storage and Handling

Scenario Description:

This practice scenario is an enclosed roofed structure for storage and mixing and loading of agrichemicals. This practice addresses water quality degradation and due to mis-handling. Storage and mixing of agrichemicals where nutrients and/or chemicals are running off into surface waters or leaching into ground water. Associated practices: Agrichemical Handling Facility (309), Heavy Use Area Protection (561), Diversion (362), Access Road (560), Pipeline (516), Roof Runoff Structure (558), Pest Management (595). Specialized labor added for design.

Before Situation:

Agrichemicals are improperly stored on the ground or next to a well. Operator mixes the agrichemicals and fills the sprayer tank next to a hydrant. Spills or overflows of agrichemicals contaminate the soil, runoff to surface waters and leaching to ground water.

After Situation:

An agrichemical storage and handling facility is protected with an enclosed building structure. The average size of the building structure is 37 ft x 42 ft (typical AHF inside dimensions are 35 ft x 40 ft). The inside of the walls will have a minimum of 12 inch hight splash protection. This practice will contain agrichemicals and prevent contamination of surface and ground water resources.

Feature Measure: Building Area - Outside Dimensions

Scenario Unit: Square Feet

Scenario Typical Size: 1,554.00

Scenario Total Cost: $54,163.39

Scenario Cost/Unit: $34.85

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$56.88	6	$341.28
Crane, truck mounted, hydraulic, 12 ton	1734	12 ton capacity truck mounted hydraulic crane. Equipment cost only.	Hours	$284.50	8	$2,276.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	8	$321.04
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	50	$5,572.50
Materials						
Dimension Lumber, Treated	1044	Treated dimension lumber with nominal thickness equal or less than 2 inches. Includes lumber and fasteners	Board Feet	$1.79	110	$196.90
Door, Insulated, Roll-up	2392	Rolling service insulated steel door, 20 gauge. Includes hardware required to install. Used to replace non insulated door in buildings. Materials only.	Square Feet	$10.08	640	$6,451.20
Post Frame Building, Enclosed 4 Sides, Hazardous Conditions	2510	Enclosed post frame building, four walls. Hazardous building sites with snow loads exceeding 30 lbs. per square foot and extreme wind exposure in areas of open terrain (flat open areas, grassland, shoreline, etc.). Includes materials, shipping, and labor only.	Square Feet	$23.36	1554	$36,301.44
Door, Steel, Standard 36'x80'	2646	A standard commercial 36 x 80 inch steel entry door.	Each	$579.93	1	$579.93
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	2	$364.16
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 367 - Roofs and Covers

Scenario: #18 - Flexible Membrane Cover

Scenario Description:

A fabricated rigid, semi-rigid, composite, or flexible membrane over a waste storage or treatment facility. The membrane will cover the entire surface of a waste storage or treatment facility (e.g. waste treatment lagoon or anaerobic digester). Cover will reduce the transmission of emissions or odors. Cover may exclude precipitation and/or capture biogas for controlled release for flaring or anaerobic digestion. Cover may be organic or inorganic. This scenario applies to either a permeable organic or inorganic cover/flexible membrane applied for odor control, rainfall exclusion or capture of biogas.Associated practices include Waste Storage Facility (313), Waste Treatment Lagoon (359), Anaerobic Digester (366), Animal Mortality Facility (316), Composting Facility (317), Roof Runoff Structure (558), Pumping Plant (533), and Waste Treatment (629).

Before Situation:

Applicable where the covering of an animal waste storage or treatment lagoon will improve management of an existing or planned agricultural waste management system by reducing the transmission of odors or by excluding precipitation.

After Situation:

A fabricated rigid, semi-rigid, composite, or flexible membrane over a waste storage or treatment facility. The membrane will cover the entire surface of a waste storage or treatment facility (e.g. waste treatment lagoon or anaerobic digester). Flexible cover will reduce the transmission of odors or will excluded precipitation from the animal waste storage or treatment lagoon.

Feature Measure: Surface of Membrane

Scenario Unit: Square Feet

Scenario Typical Size: 10,000.00

Scenario Total Cost: $18,368.97

Scenario Cost/Unit: $1.84

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	40	$250.00
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$56.88	20	$1,137.60
Track Loader, 95HP	935	Equipment and power unit costs. Labor not included.	Hours	$97.06	16	$1,552.96
Trencher, 8 in.	936	Equipment and power unit costs. Labor not included.	Hours	$50.98	8	$407.84
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	32	$918.72
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	28	$850.08
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	16	$642.08
Materials						
Synthetic Liner, 40 mil	1387	Synthetic 40 mil HDPE, LLDPE, EPDM, etc membrane liner material. Includes materials and shipping only.	Square Yard	$7.46	1334	$9,951.64
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	2	$364.16
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	3	$2,293.89

Practice: 367 - Roofs and Covers

Scenario: #19 - Wide Hoop frame and flexible Roof

Scenario Description:
A flexible membrane or fabric-like roof placed on a steel truss hoop-like supports and supporting foundation. Excess precipitation can cause nutrient laden runoff as well as odor issues. Associated practices include Waste Storage Facility (313), Animal Mortality Facility (316), Composting Facility (317), Roof Runoff Structure (558), Waste Transfer (634) and Waste Treatment (629).

Before Situation:
Applicable where the exclusion of precipitation from; 1) an animal waste storage and/or treatment facility will improve of an existing or planned system or, 2) a feedlot will minimize nutrient laden runoff or 3) a feed storage pad to minimize nutrient laden runoff.

After Situation:
A flexible membrane or fabric-like roof placed on a steel truss hoop-like supports and supporting foundation. Roof or cover will be engineered and installed in accordance with appropriate building codes and permits. Typical size is 12,000 square feet and is over an approved animal waste management facility, feedlot, or feed storage pad as a component of a CNMP. It is designed to exclude precipitation to allow proper management of waste streams (leachate, manure or compost streams), thus mitigating the negative factors due to concentrated nutrients impacting surface or groundwater.

Feature Measure: Footprint of the building

Scenario Unit: Square Feet

Scenario Typical Size: 12,000.00

Scenario Total Cost: $191,939.21

Scenario Cost/Unit: $15.99

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	95	$53,872.60
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hours	$9.89	20	$197.80
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$75.12	20	$1,502.40
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	20	$607.20
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	50	$5,572.50
Materials						
Roof, Hoop Truss Arch Structure, greater than 60 ft. wide	1669	Hoop Truss Arch Structure with fabric cover - greater than 60 ft. width, includes materials, equipment, and installation. Does not include foundation preparation.	Square Feet	$10.77	12000	$129,240.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 367 - Roofs and Covers

Scenario: #27 - Monoslope roof structure

Scenario Description:

A Steel Frame Monoslople Building, with a metal roof. The roof structure is constructed over an Animal Mortality, Compost Bin facility or another conservation practice that would need an open faced roof structure. Associated practices include Animal Mortality Facility (316), Composting Facility (316), Agrichemical Handling Facility (319), and Roof Runoff Structure (558), (561) Heavy Use Area Protection.

Before Situation:

Applicable where the exclusion of precipitation from an AFO component will improve an existing or planned system or eliminating excess moisture from precipitation will enhance the composting operation. Manure, compost, or animal mortality is stored on concrete or earthen surface. Agrichemicals are not properly stored and causing a surface water and groundwater resource concern. Excess precipitation can cause nutrients to leach from solid manure piles leading to uncontrolled runoff as well as odor issues or excess moisture can retard the microbial composting activity thereby increasing odors concerns and excess seepage into groundwater resources.

After Situation:

A Steel Frame Monoslople Building, is installed preventing precipitation from causing a resource concern and allowing better management with practices such as Animal Mortality facility, Composting Facility, Heavy Use areas, or a dry agrichemical storage facility. The roof structure is engineered and installed in accordance with appropriate building codes and permits. Typical roof size is 3,600 square feet.

Feature Measure: Roof Area

Scenario Unit: Square Feet

Scenario Typical Size: 3,600.00

Scenario Total Cost: $83,142.02

Scenario Cost/Unit: $23.10

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Roof, Steel Frame Monoslope Building, 30 to 60 ft. wide	1681	Steel Frame Monoslope Building, 30 to 60 ft. width, includes materials, equipment, and installation. Does not include foundation preparation.	Square Feet	$22.96	3600	$82,656.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 367 - Roofs and Covers

Scenario: #29 - Timber or Steel Sheet Roof

Scenario Description:

A timber framed building with a timber or steel 'sheet' roof and supporting foundation. Manure is stored as a liquid in basins, tanks, and as a solid on concrete and earthen surfaces. Excess precipitation can cause premature filling of storages or cause nutrients to leach from solid manure piles leading to uncontrolled runoff as well as odor issues. Associated practices include Waste Storage Facility (313), Animal Mortality Facility (316), Composting Facility (317), Agrichemical Handling Facility (309), Roof Runoff Structure (558), and Waste Treatment (629).

Before Situation:

Applicable where the exclusion of precipitation from an animal waste storage and/or treatment facility will improve of an existing or planned system. Manure is stored as a liquid in basins, tanks, and as a solid on concrete and earthen surfaces. Excess precipitation can cause premature filling of storages or cause nutrients to leach from solid manure piles leading to uncontrolled runoff as well as odor issues. Excess precipitation can cause premature filling of tanks and cause chemicals to contaminate runoff.

After Situation:

A timber framed building with a timber or steel 'sheet' roof and supporting foundation. Engineered and installed in accordance with appropriate building codes and permits. Typical size is 1,000 square feet and is over an approved storage or treatment facility. It is designed to prevent precipitation from allowing proper management of animal waste (solid or liquid manure or compost) or chemical contamination of surface and ground water; Thus mitigating the negative factors of added precipitation from the 'before practice situation.

Feature Measure: Footprint of building

Scenario Unit: Square Feet

Scenario Typical Size: 1,000.00

Scenario Total Cost: $17,298.79

Scenario Cost/Unit: $17.30

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Roof, Post Frame Building , less than 30 ft. wide	1672	Post Frame Building, no sides, - less than 30 ft. width. Building sites with expected snow loads up to 30 lbs. per square foot and wind exposure in semi protected areas (wooded or terrain with numerous closely spaced obstructions). Includes materials, shipping, equipment, and installation. Does not include foundation preparation.	Square Feet	$16.17	1000	$16,170.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	2	$364.16
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 367 - Roofs and Covers

Scenario: #30 - Flexible Membrane Cover with Flare

Scenario Description:

A fabricated flexible membrane over a waste storage or treatment facility. The membrane will cover the entire surface of a waste storage or treatment facility (e.g. waste treatment lagoon or anaerobic digester). Cover will exclude precipitation and/or capture biogas for controlled release for flaring or anaerobic digestion. This scenario includes the gas collection and flare system to convert methane to carbon dioxide.Associated practices include Waste Storage Facility (313), Waste Treatment Lagoon (359), Anaerobic Digester (366), Animal Mortality Facility (316), Composting Facility (317), Roof Runoff Structure (558), Pumping Plant (533), and Waste Treatment (629).

Before Situation:

Applicable where the exclusion of precipitation from an animal waste storage or treatment lagoon will improve the management of an existing or planned system, capture and controlled release or flaring of emissions from an existing or planned animal waste storage to improve air quality, and/or biogas production and capture for energy use are part of the existing or planned animal waste management system.

After Situation:

A fabricated flexible membrane over a 200 ft x 300 ft waste storage pond. The membrane will cover the entire surface of a waste storage or treatment facility (e.g. waste storage pond, waste treatment lagoon or anaerobic digester). A flare is included to burn off the captured emitted methane. Methane collection system under the cover is installed on a per acre rate basis. Precipitation is excluded from the animal waste storage or treatment facility and air quality is improved with the conversion of methane to carbon dioxide.

Feature Measure: Surface of Membrane

Scenario Unit: Square Feet

Scenario Typical Size: 60,000.00

Scenario Total Cost: $710,749.21

Scenario Cost/Unit: $11.85

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	100	$625.00
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$56.88	56	$3,185.28
Track Loader, 95HP	935	Equipment and power unit costs. Labor not included.	Hours	$97.06	40	$3,882.40
Trencher, 8 in.	936	Equipment and power unit costs. Labor not included.	Hours	$50.98	24	$1,223.52
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	40	$1,754.80
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	96	$2,756.16
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	80	$2,428.80
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	40	$1,605.20
Materials						
Synthetic Liner, 40 mil	1387	Synthetic 40 mil HDPE, LLDPE, EPDM, etc membrane liner material. Includes materials and shipping only.	Square Yard	$7.46	8000	$59,680.00
Covered Lagoon Gas Collection System	1664	Piping and collection system for biogas. Includes labor and equipment.	Each	$398,000.00	1.4	$557,200.00
Covered Lagoon Flare	1666	Flare excess gas to convert from methane to carbon dioxide. Includes labor and equipment.	Each	$73,750.00	1	$73,750.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	2	$364.16
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	3	$2,293.89

Practice: 368 - Emergency Animal Mortality Management

Scenario: #46 - In-House Composting

Scenario Description:

This scenario consists the emergency disposal of poultry mortality by composting in a static windrow. The cause of mortatiy is an event not related to disease. Additional carbon based bulking material is added to facilitate aeration and provide a proper C:N ratio. The windrow is turned at least once to go into another heat cycle prior to land application. Access is infrequent. This option may not be desirable for sites with limited area, karst topography, and not isolated from of public view. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Pond Sealing or Lining, Bentonite Sealant (521C), Pond Sealing or Lining, Compacted Clay Treatment (521D), Pond Sealing or Lining, Soil Dispersant (521B), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Diversion (362).

Before Situation:

Animal mortality is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, or interaction with predators. No plan was formulated for catastrophic mortality events.

After Situation:

Animal mortality is being done in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, complete composting, and protection from predators to minimize pathogen survival or spreading. An overall plan covers normal and catastrophic mortality events.The typical scenario number of birds to be disposed of is 20,000, 4 pound birds which can be composted in-house. Composting requires 1.5 pounds of carbon per pound of bird. There is 0.5 pounds of litter per bird already on site. Wood chips (45 pcf) will be used as the additional carbon source.The composting windrow construction operation consists of 2 pieces of equipment and 2 add'l laborers: 1) stockpiling birds and litter in center of house; 2) construct 2 windrow bases using carbon material; 3) place carcass/litter mix on bases; 4) cover with carbon material; 5) cap windrows with any remaining litter; 6) after first heat cycle remove windrow from house and reconstruct outside house for finishing. Site to be located out of drainage areas, off-site water diverted and any runoff to spread out into a grassed area.

Feature Measure: Number of 1000 lbs Animal Units

Scenario Unit: Animal Unit

Scenario Typical Size: 80.00

Scenario Total Cost: $9,096.08

Scenario Cost/Unit: $113.70

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$56.88	28	$1,592.64
Aggregate, Wood Chips	1098	Includes materials, equipment and labor to transport and place.	Cubic Yards	$50.92	91	$4,633.72
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	28	$803.88
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	28	$850.08
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	4	$1,215.76

Practice: 368 - Emergency Animal Mortality Management

Scenario: #47 - Burial

Scenario Description:

This scenario consists of the on-site burial of animal mortalities resulting from catastrophic events not related to disease. An earthen pit is excavated to contain the mortalities, and earth cover is placed over the mortalities to provide protection from predators to minimize pathogen survival or spreading. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Pond Sealing or Lining, Bentonite Sealant (521C), Pond Sealing or Lining, Compacted Clay Treatment (521D), Pond Sealing or Lining, Soil Dispersant (521B), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), and Diversion (362).

Before Situation:

Animal mortality disposal is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, incineration, or interaction with predators. No plan was formulated for catastrophic mortality events.

After Situation:

Catastrophic Animal mortalities resulting from causes not related to disease are being disposed in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, and protection from predators to minimize pathogen survival or spreading. An overall plan covers the burial of animals as a result of catastrophic mortality events.This typical scenario was developed based on the disposal of 25 head of mature cattle located near the area where the cattle have been found. The scenario includes equipment time and labor to recover and transport carcasses to the burial location. The scenario also includes a burial trench 4' deep plus 3' additional cover over carcasses. Construct a 6' x 60' (surface dimensions) burial site with appropriate cover. Site can handle mortality for 25 mature beef cattle. On site soils can be re-compacted to meet required imperviousness. Include 3' overfill or mounding excavated material to provide for settlement of the burial site and divert or minimize offsite runoff. Site to be located out of drainage areas, off-site water diverted and any runoff to spread out into a grassed area.

Feature Measure: Number of 1000 lbs Animal Units

Scenario Unit: Animal Unit

Scenario Typical Size: 25.00

Scenario Total Cost: $3,769.04

Scenario Cost/Unit: $150.76

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.45	94	$324.30
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$75.12	12	$901.44
Excavation, common earth, large equipment, 50 ft	1222	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yards	$1.56	94	$146.64
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	12	$344.52
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	12	$364.32
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 368 - Emergency Animal Mortality Management

Scenario: #48 - Burial of Cattle or Horses

Scenario Description:

This scenario consists of the on-site burial of cattle or horse mortalities resulting from catastrophic events not related to disease. An earthen pit is excavated to contain the mortalities, and earth cover is placed over the mortalities to provide protection from predators to minimize pathogen survival or spreading. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Pond Sealing or Lining, Bentonite Sealant (521C), Pond Sealing or Lining, Compacted Clay Treatment (521D), Pond Sealing or Lining, Soil Dispersant (521B), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), and Diversion (362).

Before Situation:

Animal mortality disposal is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, incineration, or interaction with predators.

After Situation:

Catastrophic Animal mortalities resulting from causes not related to disease are being disposed in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, and protection from predators to minimize pathogen survival or spreading. An overall plan covers the burial of animals as a result of catastrophic mortality events.This typical scenario was developed based on the disposal of 5 head averaging 1000 pounds each located near the area where the cattle have been found. The scenario includes equipment time and labor to recover and transport carcasses to the burial location. The scenario also includes a burial trench 4' deep plus 2' additional cover over carcasses. Construct a 16'W x 32'L (surface dimensions) burial site with appropriate cover. On site soils can be recompacted to meet required imperviousness. Include 2' overfill or mounding excavated material to provide for settlement of the burial site and divert or minimize offsite runoff. Site to be located out of drainage areas, off-site water diverted and any runoff to spread out into a grassed area.

Feature Measure: Number of head

Scenario Unit: Each

Scenario Typical Size: 5.00

Scenario Total Cost: $3,160.22

Scenario Cost/Unit: $632.04

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.45	78	$269.10
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$75.12	5	$375.60
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	10	$287.10
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	5	$151.80
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	8	$388.80
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 368 - Emergency Animal Mortality Management

Scenario: #49 - Burial of Swine

Scenario Description:

This scenario consists of the on-site burial of swine or other similarly sized animal mortalities on a small size operation resulting from catastrophic events not related to disease. An earthen pit is excavated to contain the mortalities, and earth cover is placed over the mortalities to provide protection from predators to minimize pathogen survival or spreading. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Pond Sealing or Lining, Bentonite Sealant (521C), Pond Sealing or Lining, Compacted Clay Treatment (521D), Pond Sealing or Lining, Soil Dispersant (521B), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), and Diversion (362).

Before Situation:

Animal mortality disposal is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, incineration, or interaction with predators.

After Situation:

Catastrophic Animal mortalities resulting from causes not related to disease are being disposed in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, and protection from predators to minimize pathogen survival or spreading. An overall plan covers the burial of animals as a result of catastrophic mortality events.This typical scenario was developed based on the burial of 1 boar at 450 pounds, 9 sows at 350 pounds each and 8 babies/sow at 12 pounds each in a landfill. The number of head counted are the sows and boar (adult swine) at 10 total head. The scenario includes equipment time and labor to recover and transport carcasses to the burial location. The scenario also includes a burial trench 4' deep plus 2' additional cover over carcasses. Construct a 16'W x 52'L (surface dimensions) burial site with appropriate cover. On site soils can be recompacted to meet required imperviousness. Include 2' overfill or mounding excavated material to provide for settlement of the burial site and divert or minimize offsite runoff. Site to be located out of drainage areas, off-site water diverted and any runoff to spread out into a grassed area.

Feature Measure: Number of Adult Head

Scenario Unit: Each

Scenario Typical Size: 10.00

Scenario Total Cost: $2,799.62

Scenario Cost/Unit: $279.96

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.45	78	$269.10
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$75.12	3	$225.36
Excavation, common earth, large equipment, 50 ft	1222	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yards	$1.56	40	$62.40
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	6	$172.26
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	3	$91.08
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	6	$291.60
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 368 - Emergency Animal Mortality Management

Scenario: #50 - Burial of Goat or Sheep

Scenario Description:

This scenario consists of the on-site burial of goat, sheep or other similarly sized animal mortalities on a small size operation resulting from catastrophic events not related to disease. An earthen pit is excavated to contain the mortalities, and earth cover is placed over the mortalities to provide protection from predators to minimize pathogen survival or spreading. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Pond Sealing or Lining, Bentonite Sealant (521C), Pond Sealing or Lining, Compacted Clay Treatment (521D), Pond Sealing or Lining, Soil Dispersant (521B), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), and Diversion (362).

Before Situation:

Animal mortality disposal is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, incineration, or interaction with predators.

After Situation:

Catastrophic Animal mortalities resulting from causes not related to disease are being disposed in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, and protection from predators to minimize pathogen survival or spreading. An overall plan covers the burial of animals as a result of catastrophic mortality events.This typical scenario was developed based on the burial of 10 head of 100 pound average weight goats. The scenario includes equipment time and labor to recover and transport carcasses to the burial location. The scenario also includes a burial trench 3' deep plus 2' additional cover over carcasses. Construct a 12'W x 29'L (surface dimensions) burial site with appropriate cover. On site soils can be recompacted to meet required imperviousness. Include 2' overfill or mounding excavated material to provide for settlement of the burial site and divert or minimize offsite runoff. Site to be located out of drainage areas, off-site water diverted and any runoff to spread out into a grassed area.

Feature Measure: Number of Head

Scenario Unit: Each

Scenario Typical Size: 10.00

Scenario Total Cost: $2,429.00

Scenario Cost/Unit: $242.90

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.45	30	$103.50
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$75.12	2	$150.24
Excavation, common earth, large equipment, 50 ft	1222	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yards	$1.56	13	$20.28
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	4	$114.84
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	2	$60.72
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	6	$291.60
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 368 - Emergency Animal Mortality Management

Scenario: #51 - Cattle or Horse Disposal Other Than Burial

Scenario Description:

This scenario consists of the disposal of cattle, horse or other similarly sized animal carcasses by methods other than burial resulting from catastrophic events not related to disease. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Critical Area Planting (342), Nutrient Management (590), Access Road (560)

Before Situation:

Animal mortality disposal is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, incineration, or interaction with predators.

After Situation:

Catastrophic Animal mortalities resulting from causes not related to disease are being disposed in a manner, other than burial, that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, and protection from predators to minimize pathogen survival or spreading. An overall plan covers the burial of animals as a result of catastrophic mortality events.This typical scenario was developed based on the disposal of 5 head averaging 1000 pounds each in a landfill. The scenario includes materials, equipment time and labor to recover and transport carcasses to the landfill which is a distance of 35 miles from the farm.

Feature Measure: Number of Head

Scenario Unit: Each

Scenario Typical Size: 5.00

Scenario Total Cost: $3,213.41

Scenario Cost/Unit: $642.68

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$75.12	5	$375.60
Truck, dump, 8 CY	1401	Dump truck for moving bulk material. Typically capacity is 12 ton or 8 cubic yards. Includes equipment only.	Hours	$55.22	8	$441.76
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	5	$143.55
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	5	$151.80
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	8	$321.04
Materials						
Poly film, 6 mil.	245	6 mil, polyethylene, black	Square Feet	$0.09	360	$32.40
Landfill Fee, Animal Carcass	2711	Fees charged by a landfill for proper disposal of animal carcass or animal debris	Cubic Yards	$54.50	4	$218.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 368 - Emergency Animal Mortality Management

Scenario: #52 - Swine Disposal Other Than Burial

Scenario Description:

This scenario consists of the disposal of swine or other similarly sized animal carcasses on a small size operation by methods other than burial resulting from catastrophic events not related to disease. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Critical Area Planting (342), Nutrient Management (590), Access Road (560)

Before Situation:

Animal mortality disposal is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, incineration, or interaction with predators.

After Situation:

Catastrophic Animal mortalities resulting from causes not related to disease are being disposed in a manner, other than burial, that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, and protection from predators to minimize pathogen survival or spreading. An overall plan covers the burial of animals as a result of catastrophic mortality events.This typical scenario was developed based on the disposal of 1 boar at 450 pounds, 9 sows at 350 pounds each and 8 babies/sow at 12 pounds each in a landfill. The number of head counted are the sows and boar (adult swine) at 10 total head. The scenario includes materials, equipment time and labor to recover and transport the boar, sows and baby carcasses to the landfill which is a distance of 35 miles from the farm.

Feature Measure: Number of Adult Head

Scenario Unit: Each

Scenario Typical Size: 10.00

Scenario Total Cost: $2,695.15

Scenario Cost/Unit: $269.52

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$75.12	3	$225.36
Truck, dump, 8 CY	1401	Dump truck for moving bulk material. Typically capacity is 12 ton or 8 cubic yards. Includes equipment only.	Hours	$55.22	6	$331.32
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	3	$86.13
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	3	$91.08
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	6	$240.78
Materials						
Poly film, 6 mil.	245	6 mil, polyethylene, black	Square Feet	$0.09	308	$27.72
Landfill Fee, Animal Carcass	2711	Fees charged by a landfill for proper disposal of animal carcass or animal debris	Cubic Yards	$54.50	3	$163.50
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 368 - Emergency Animal Mortality Management

Scenario: #53 - Disposal of Goats or Sheep Other Than Burial

Scenario Description:

This scenario consists of the disposal of goat, sheep or other similarly sized animal carcasses on a small size operation by methods other than burial resulting from catastrophic events not related to disease. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Critical Area Planting (342), Nutrient Management (590), Access Road (560)

Before Situation:

Animal mortality disposal is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, incineration, or interaction with predators.

After Situation:

Catastrophic Animal mortalities resulting from causes not related to disease are being disposed in a manner, other than burial, that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, and protection from predators to minimize pathogen survival or spreading. An overall plan covers the burial of animals as a result of catastrophic mortality events.This typical scenario was developed based on the disposal of 10 head of goats at an average weight of 100 pounds each in a landfill. All head are counted. The scenario includes materials, equipment time and labor to recover and transport the goat carcasses to the landfill which is a distance of 35 miles from the farm.

Feature Measure: Number of Head

Scenario Unit: Each

Scenario Typical Size: 10.00

Scenario Total Cost: $2,353.19

Scenario Cost/Unit: $235.32

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$75.12	2	$150.24
Truck, dump, 8 CY	1401	Dump truck for moving bulk material. Typically capacity is 12 ton or 8 cubic yards. Includes equipment only.	Hours	$55.22	5	$276.10
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	2	$57.42
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	2	$60.72
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	5	$200.65
Materials						
Poly film, 6 mil.	245	6 mil, polyethylene, black	Square Feet	$0.09	270	$24.30
Landfill Fee, Animal Carcass	2711	Fees charged by a landfill for proper disposal of animal carcass or animal debris	Cubic Yards	$54.50	1	$54.50
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 368 - Emergency Animal Mortality Management

Scenario: #54 - Outside Windrow Composting

Scenario Description:

This scenario consists the emergency disposal of a large number of livestock mortality by composting in a static windrow. The cause of mortality is an event not related to disease. Additional carbon based bulking material is added to facilitate aeration and provide a proper C:N ratio. The windrow is turned at least once to go into another heat cycle prior to land application. Access is infrequent. This option may not be desirable for sites with limited area, karst topography, and not isolated from of public view. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Diversion (362).

Before Situation:

Animal mortality is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, or interaction with predators.

After Situation:

Animal mortality is being done in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, complete composting, and protection from predators to minimize pathogen survival or spreading. An overall plan covers normal and catastrophic mortality events.This typical scenario was developed based on the composting of 20 head of cattle averaging 1000 pound each which are moved to a location on-site that is suitable for composting. The scenario includes equipment time and labor to recover and transport carcasses to the composting location and the building an turning of the pile at the appropriate time. Composting requires 1.5 pounds of carbon per pound of animal. A small volume of green manure or waste feed is available on site. Wood chips (45 pcf) will be used as the carbon source.The composting windrow construction operation consists of 2 pieces of equipment and 1 add'l laborer: 1) collecting and transporting carcasses to compost site; 2) constructing compost windrow base using carbon material; 3) place carcasses 4) cover carcasses with green manure/waste feed; 4) cover with carbon material; 5) cap windrow with any remaining manure/feed; 6) after first heat cycle turn the windrow over and reconstruct for finishing. Site to be located out of drainage areas, off-site water diverted and any runoff to spread out into a grassed area.

Feature Measure: Number of 1000 lbs Animal Units

Scenario Unit: Animal Unit

Scenario Typical Size: 20.00

Scenario Total Cost: $19,978.72

Scenario Cost/Unit: $998.94

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$75.12	55	$4,131.60
Aggregate, Wood Chips	1098	Includes materials, equipment and labor to transport and place.	Cubic Yards	$50.92	148	$7,536.16
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	55	$1,579.05
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	55	$1,669.80
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	18	$874.80
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	2	$364.16
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	5	$3,823.15

Practice: 368 - Emergency Animal Mortality Management

Scenario: #78 - Forced Air Incineration

Scenario Description:

This scenario consists the emergency disposal of a large number of livestock by a portable forced air incinerator. The cause of mortality is an event not related to disease. Additional carbon based bulking material is added to facilitate aeration and provide a proper C:N ratio. The windrow is turned at least once to go into another heat cycle prior to land application. Access is infrequent. This option may not be desirable for sites with limited area, karst topography, and not isolated from of public view. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Critical Area Planting (342), Nutrient Management (590), Access Road (560), Diversion (362).

Before Situation:

Animal mortality disposal is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, incineration, or interaction with predators.

After Situation:

Animal mortality is being done in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, complete composting, and protection from predators to minimize pathogen survival or spreading. An overall plan covers normal and catastrophic mortality events.This typical scenario was developed based on the forced air incineration of the carcasses of 50 head of cattle averaging 1000 pound each. The scenario includes equipment time and labor to recover and transport carcasses to a suitable on-site incineration location and the rental and operation of a portable forced air incinerator. Wood fuel is also added to assist with the incineration process.The forced air incineration operation consists of a tractor plus operator to collect and transport carcasses to the incineration site, a portable forced air incinerator plus operator, and 1 add'l laborer. Site to be located out of drainage areas, off-site water diverted and any runoff to spread out into a grassed area.

Feature Measure: Number of 1000 lbs Animal Units

Scenario Unit: Animal Unit

Scenario Typical Size: 50.00

Scenario Total Cost: $17,888.95

Scenario Cost/Unit: $357.78

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$75.12	50	$3,756.00
Aggregate, Wood Chips	1098	Includes materials, equipment and labor to transport and place.	Cubic Yards	$50.92	42	$2,138.64
Incinerator, Portable, Trench Burner	2712	A portable incinerator used with the development of a trench to incinerate animal carcasses or other debris	Week	$1,443.33	2	$2,886.66
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	50	$1,435.50
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	94	$2,853.84
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	56	$2,721.60
Materials						
Fuel, propane	1597	20 pound propane bottle, with propane, for ignition of prescribed burns. Materials only.	Each	$12.61	45	$567.45
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 368 - Emergency Animal Mortality Management

Scenario: #79 - Disposal At Landfill or Render

Scenario Description:

This scenario consists of the disposal of animal mortality carcasses by landfilling or rendering resulting from catastrophic events not related to disease. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Critical Area Planting (342), Nutrient Management (590), Access Road (560)

Before Situation:

Animal mortality disposal is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, incineration, or interaction with predators. No plan was formulated for catastrophic mortality events.

After Situation:

Catastrophic Animal mortalities resulting from causes not related to disease are being disposed in a manner, other than burial, that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, and protection from predators to minimize pathogen survival or spreading. An overall plan covers disposal of animals as a result of catastrophic mortality events.This typical scenario was developed based on the disposal of 700 finisher swine carcasses at an average weight of 200 pounds each in a landfill. The scenario includes materials, equipment time and labor to recover and transport the carcasses to the landfill which is within a 1.5 hour drive of the farm.

Feature Measure: Pounds of mortality

Scenario Unit: Pound

Scenario Typical Size: 140,000.00

Scenario Total Cost: $11,092.08

Scenario Cost/Unit: $0.08

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$56.88	5	$284.40
Truck, dump, 8 CY	1401	Dump truck for moving bulk material. Typically capacity is 12 ton or 8 cubic yards. Includes equipment only.	Hours	$55.22	39	$2,153.58
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	5	$143.55
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	5	$151.80
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	39	$1,565.07
Materials						
Poly film, 6 mil.	245	6 mil, polyethylene, black	Square Feet	$0.09	3388	$304.92
Landfill Fee, Animal Carcass	2711	Fees charged by a landfill for proper disposal of animal carcass or animal debris	Cubic Yards	$54.50	91	$4,959.50
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 368 - Emergency Animal Mortality Management

Scenario: #181 - National Emergency Shallow Burial of Swine or Cattle

Scenario Description:

This scenario consists of the disposal of animal carcasses by burial in a shallow trench resulting from impacts related to the National Emergency. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, and organics being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. This scenario has been written to exclude feathered animals since early research has indicated that feathered animals do not break down quickly using this method.Potential Associated Practices: Critical Area Planting (342), Nutrient Management (590), Access Road (560), Fence (384)

Before Situation:

Animal mortality disposal is done in a manner that results in non-point source pollution of excessive nutrients, and organics being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, incineration, or interaction with predators. No plan was formulated for catastrophic mortality events.

After Situation:

Emergency animal mortalities resulting from causes not related to disease are being buried in a shallow trench,that prevents non-point source pollution of excessive nutrients, and organics being transported into surface and groundwater resources. The is a new method of mortality disposal recommended by APHIS. 50 animal units (50,000 pound) of animal mortality is the maximum allowed for this method. Proper operation results in little to no odors, and protection from predators to minimize pathogen survival or spreading. An overall plan covers the disposal of animals as a result of catastrophic mortality events. This typical scenario was developed based on the disposal of livestock animal mortality by burial in an 18 inch deep by 8 foot wide trench. A 12 inch thick layer of carbon material is placed in the bottom of the trench. The carcass is placed in the trench and covered with 4 inches of carbon material. Then the excavated soil is placed over the entire trench area. The scenario includes equipment time and labor to excavate the trench, place carbon layer in the trench bottom, recover and transport carcasses to the shallow burial location, place carcasses in the trench and cover with more carbon and the excavated soil. Wood chips (45 pcf) will be used as the carbon source.

Feature Measure: Number of 1000 lbs Animal Units

Scenario Unit: Animal Unit

Scenario Typical Size: 50.00

Scenario Total Cost: $10,225.25

Scenario Cost/Unit: $204.51

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	4	$522.04
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$75.12	13	$976.56
Aggregate, Wood Chips	1098	Includes materials, equipment and labor to transport and place.	Cubic Yards	$50.92	120	$6,110.40
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	13	$373.23
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	13	$394.68
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	4	$160.52
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 368 - Emergency Animal Mortality Management

Scenario: #197 - National Emergency Composting ??? purchase carbon material and mobilize equipment

Scenario Description:

This scenario consists of the disposal of animal carcasses by composting in a static windrow resulting from impacts related to the National Emergency. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, and organics being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Critical Area Planting (342), Nutrient Management (590), Access Road (560)

Before Situation:

Animal mortality disposal is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors from incomplete composting, incineration, or interaction with predators. No plan was formulated for catastrophic mortality events.

After Situation:

Emergency animal mortalities resulting from causes not related to disease are being disposed by composting in a static windrow that prevents non-point source pollution of excessive nutrients, and organics being transported into surface and groundwater resources. Proper operation results in little to no odors, and protection from predators. An overall plan covers the disposal of animals as a result of catastrophic mortality events.This typical scenario was developed based on the disposal of 30,000 pounds of animal mortality by composting on-site. The scenario includes equipment time and labor to recover and transport carcasses to the composting location and the building and turning of the pile at the appropriate time. Composting requires 5 cubic yards of carbon material per 1000 pounds of animal. Wood chips (45 pcf) will be used as the carbon source.

Feature Measure: Number of 1000 lbs Animal Units

Scenario Unit: Animal Unit

Scenario Typical Size: 30.00

Scenario Total Cost: $16,911.87

Scenario Cost/Unit: $563.73

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$75.12	55	$4,131.60
Aggregate, Wood Chips	1098	Includes materials, equipment and labor to transport and place.	Cubic Yards	$50.92	150	$7,638.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	55	$1,579.05
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	55	$1,669.80
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	2	$364.16
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 368 - Emergency Animal Mortality Management

Scenario: #213 - National Emergency Carcass Disposal Other Than Burial, Incineration, Landfill or Render

Scenario Description:

This scenario consists of the disposal of animal carcasses by methods other than burial, incineration, landfill or rendering resulting from impacts related to the National Emergency. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Critical Area Planting (342), Nutrient Management (590), Access Road (560)

Before Situation:

Animal mortality disposal is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, incineration, or interaction with predators. No plan was formulated for catastrophic mortality events.

After Situation:

Emergency animal mortalities resulting from causes not related to disease are being disposed in a manner, other than burial, incineration, landfill or rendering, that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, and protection from predators to minimize pathogen survival or spreading. An overall plan covers the disposal of animals as a result of catastrophic mortality events. This typical scenario was developed based on the disposal of livestock carcasses by composting on-site. The scenario assumes the grower will provide all equipment and labor and that 50% of the carbon for composting is available on-site.

Feature Measure: Number of 1000 lbs Animal Units

Scenario Unit: Animal Unit

Scenario Typical Size: 30.00

Scenario Total Cost: $11,199.45

Scenario Cost/Unit: $373.32

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$75.12	55	$4,131.60
Aggregate, Wood Chips	1098	Includes materials, equipment and labor to transport and place.	Cubic Yards	$50.92	75	$3,819.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	55	$1,579.05
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	55	$1,669.80

Practice: 368 - Emergency Animal Mortality Management

Scenario: #229 - National Emergency Disposal At Landfill or Render

Scenario Description:

This scenario consists of the disposal of animal mortality carcasses by landfilling or rendering resulting from impacts related to the National Emergency. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Critical Area Planting (342), Nutrient Management (590), Access Road (560)

Before Situation:

Animal mortality disposal is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, incineration, or interaction with predators. No plan was formulated for catastrophic mortality events.

After Situation:

Catastrophic Animal mortalities resulting from causes not related to disease are being disposed in a landfill or by rendering, that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, and protection from predators to minimize pathogen survival or spreading. An overall plan covers disposal of animals as a result of catastrophic mortality events.This typical scenario was developed based on the disposal of 700 finisher swine carcasses at an average weight of 200 pounds each in a landfill. The scenario includes materials, equipment time and labor to recover and transport the carcasses to the landfill which is within a 1.5 hour drive of the farm.

Feature Measure: Pounds of mortality

Scenario Unit: Pound

Scenario Typical Size: 140,000.00

Scenario Total Cost: $11,092.08

Scenario Cost/Unit: $0.08

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$56.88	5	$284.40
Truck, dump, 8 CY	1401	Dump truck for moving bulk material. Typically capacity is 12 ton or 8 cubic yards. Includes equipment only.	Hours	$55.22	39	$2,153.58
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	5	$143.55
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	5	$151.80
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	39	$1,565.07
Materials						
Poly film, 6 mil.	245	6 mil, polyethylene, black	Square Feet	$0.09	3388	$304.92
Landfill Fee, Animal Carcass	2711	Fees charged by a landfill for proper disposal of animal carcass or animal debris	Cubic Yards	$54.50	91	$4,959.50
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 368 - Emergency Animal Mortality Management

Scenario: #245 - National Emergency In-House Composting

Scenario Description:

This scenario consists the emergency disposal of poultry mortality by composting in a static windrow resulting from impacts related to the National Emergency. Additional carbon based bulking material is added to facilitate aeration and provide a proper C:N ratio. The windrow is turned at least once to go into another heat cycle prior to land application. Access is infrequent. This option may not be desirable for sites with limited area, karst topography, and not isolated from of public view. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Pond Sealing or Lining, Bentonite Sealant (521C), Pond Sealing or Lining, Compacted Clay Treatment (521D), Pond Sealing or Lining, Soil Dispersant (521B), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Diversion (362).

Before Situation:

Animal mortality is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, or interaction with predators. No plan was formulated for catastrophic mortality events.

After Situation:

Animal mortality disposal is being done in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, complete composting, and protection from predators to minimize pathogen survival or spreading. An overall plan covers normal and catastrophic mortality events. The typical scenario consists of in-house composting of animal mortality. Composting requires 1.5 pounds of carbon per pound of mortatility. There is some manure and bedding already on site. Wood chips (45 pcf) will be used as the additional carbon source. The composting windrow construction operation consists of 2 pieces of equipment and 2 add'l laborers: 1) stockpiling carcasses, bedding, and manure in center of house; 2) construct 2 windrow bases using carbon material; 3) place carcass/bedding/manure mix on bases; 4) cover with carbon material; 5) cap windrows with any remaining bedding/manure; 6) after first heat cycle remove windrow from house and reconstruct outside house for finishing. Site to be located out of drainage areas, off-site water diverted and any runoff to spread out into a grassed area.

Feature Measure: Number of 1000 lbs Animal Units

Scenario Unit: Animal Unit

Scenario Typical Size: 80.00

Scenario Total Cost: $9,460.24

Scenario Cost/Unit: $118.25

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$56.88	28	$1,592.64
Aggregate, Wood Chips	1098	Includes materials, equipment and labor to transport and place.	Cubic Yards	$50.92	91	$4,633.72
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	28	$803.88
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	28	$850.08
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	2	$364.16
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	4	$1,215.76

Practice: 368 - Emergency Animal Mortality Management

Scenario: #261 - National Emergency Forced Air Incineration

Scenario Description:

This scenario consists the emergency disposal of a large number of livestock resulting from impacts related to the National Emergency. The cause of mortatiy is an event not related to disease. Additional carbon based bulking material is added to facilitate aeration and provide a proper C:N ratio. The windrow is turned at least once to go into another heat cycle prior to land application. Access is infrequent. This option may not be desirable for sites with limited area, karst topography, and not isolated from of public view. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Critical Area Planting (342), Nutrient Management (590), Access Road (560), Diversion (362).

Before Situation:

Animal mortality disposal is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, incineration, or interaction with predators. No plan was formulated for catastrophic mortality events.

After Situation:

Animal mortality is being done in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. An overall plan covers normal and catastrophic mortality events. This typical scenario was developed based on the forced air incineration of 50 animal units of livestock carcasses. The scenario includes equipment time and labor to recover and transport carcasses to a suitable on-site incineration location and the rental and operation of a portable forced air incinerator. Wood fuel is also added to assist with the incineration process. The forced air incineration operation consists of a tractor plus operator to collect and transport carcasses to the incineration site, a portable forced air incinerator plus operator, and 1 add'l laborer. Site to be located out of drainage areas, off-site water diverted and any runoff to spread out into a grassed area.The forced air incineration operation consists of a tractor plus operator to collect and transport carcasses to the incineration site, a portable forced air incinerator plus operator, and 1 add'l laborer. Site to be located out of drainage areas, off-site water diverted and any runoff to spread out into a grassed area.

Feature Measure: Number of 1000 lbs Animal Units

Scenario Unit: Animal Unit

Scenario Typical Size: 50.00

Scenario Total Cost: $17,888.95

Scenario Cost/Unit: $357.78

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$75.12	50	$3,756.00
Aggregate, Wood Chips	1098	Includes materials, equipment and labor to transport and place.	Cubic Yards	$50.92	42	$2,138.64
Incinerator, Portable, Trench Burner	2712	A portable incinerator used with the development of a trench to incinerate animal carcasses or other debris	Week	$1,443.33	2	$2,886.66
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	50	$1,435.50
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	94	$2,853.84
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	56	$2,721.60
Materials						
Fuel, propane	1597	20 pound propane bottle, with propane, for ignition of prescribed burns. Materials only.	Each	$12.61	45	$567.45
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 368 - Emergency Animal Mortality Management

Scenario: #277 - National Emergency Burial

Scenario Description:

This scenario consists of the on-site burial of animal mortalities resulting from impacts related to the National Emergency. An earthen pit is excavated to contain the mortalities, and earth cover is placed over the mortalities to provide protection from predators to minimize pathogen survival or spreading. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Air quality impacts due to odors will also be addressed. Potential Associated Practices: Pond Sealing or Lining, Bentonite Sealant (521C), Pond Sealing or Lining, Compacted Clay Treatment (521D), Pond Sealing or Lining, Soil Dispersant (521B), Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), and Diversion (362).

Before Situation:

Animal mortality disposal is done in a manner that results in non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Improper operation results in odors and spread of pathogens from incomplete composting, incineration, or interaction with predators. No plan was formulated for catastrophic mortality events.

After Situation:

Catastrophic Animal mortalities resultuing from causes not related to disease are being disposed in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources. Proper operation results in little to no odors, and protection from predators to minimize pathogen survival or spreading. An overall plan covers the burial of animals as a result of catastrophic mortality events.This typical scenario was developed based on the disposal of 25 head of mature cattle located near the area where the cattle have been found. The scenario includes equipment time and labor to recover and transport carcasses to the burial location. The scenario also includes a burial trench 4' deep plus 3' additional cover over carcasses. Construct a 6' x 60' (surface dimensions) burial site with appropriate cover. Site can handle mortality for 25 mature beef cattle. On site soils can be recompacted to meet required imperviousness. Include 3' overfill or mounding excavated material to provide for settlement of the burial site and divert or minimize offsite runoff. Site to be located out of drainage areas, off-site water diverted and any runoff to spread out into a grassed area.

Feature Measure: Number of 1000 lbs Animal Units

Scenario Unit: Animal Unit

Scenario Typical Size: 25.00

Scenario Total Cost: $3,769.04

Scenario Cost/Unit: $150.76

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.45	94	$324.30
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$75.12	12	$901.44
Excavation, common earth, large equipment, 50 ft	1222	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yards	$1.56	94	$146.64
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	12	$344.52
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	12	$364.32
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 371 - Air Filtration and Scrubbing

Scenario: #9 - Biofilter-Traditional Horizontal

Scenario Description:
Porous filter media is utilized to filter the exhaust from animal confinement facilities to allow microbial activity to reduce objectionable odors. The typical installation is a horizontal media bed supported by a treated lumber substructure to allow airflow from multiple fans to be directed beneath and then up through the media. Vertical biofilters may also be utilized. The filter media is a combination of wood chips to maintain porosity and compost to provide the microorganisms for the air filtering activity. A typical mix ratio would be 80% wood chips and 20% compost. Ventilation system component alterations that may be required to facilitate the biofilter application are not included in the cost computation. Payment includes materials, equipment, and labor costs for installing the biofilter. A stabilized area around the biofilter is not included and must be addressed through the associated practice of Heavy Use Area Protection (561), if needed. Resource concern: Air ??? Objectionable Odors

Before Situation:
The animal confinement facility has an uncontrolled airflow that is causing objectionable odors.

After Situation:
A 32' X 200' horizontal media bed, 20' thick is supported by a treated lumber substructure to allow airflow to be directed beneath and then up through the media is installed adjacent to a swine production facility. Exhaust from the facility is directed to flow through the biofilter media to reduce objectionable odors. Maintainace of the media bed will be required on a 3-5 year cycle to maintain effectiveness.Associated practices include Heavy Use Area Protection (561), Amendments for Treatment of Agricultural Waste (591), Windbreak (380), Waste Storage Facility (313), Composting Facility (317), and CAP-Comprehensive Air Quality Management Plan (126).

Feature Measure: Biofilter Media Volume

Scenario Unit: Cubic Yards

Scenario Typical Size: 395.00

Scenario Total Cost: $22,285.36

Scenario Cost/Unit: $56.42

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$100.26	2	$200.52
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	24	$689.04
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	2	$80.26
Materials						
Compost	265	A mixture of decaying organic matter, as from leaves and manure, used to improve soil structure and provide nutrients.	Ton	$52.20	20	$1,044.00
Dimension Lumber, Treated	1044	Treated dimension lumber with nominal thickness equal or less than 2 inches. Includes lumber and fasteners	Board Feet	$1.79	9550	$17,094.50
Post, Wood, Untreated, 8-9 inch dia. X 8 ft.	1078	Wood Post, End 8-9 inch diameter x 8 foot long, untreated. Includes materials and shipping only.	Each	$38.99	30	$1,169.70
Plywood, 3/4 inch, treated	2363	Treated 4 x 8 ft. sheets of 3/4 inch exterior grade plywood	Each	$50.38	30	$1,511.40
Biofilter Media Netting	2640	UV stabilized, 3/4 inch polypropylene mesh. Materials and shipping only.	Square Feet	$0.03	6400	$192.00
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 371 - Air Filtration and Scrubbing

Scenario: #10 - Biofilter-Single Pit Fan

Scenario Description:
Establishment of a biofilter used to treat the air flow from a single waste pit ventilation fan in instances where control of the exhaust from all pit ventilation fans is not needed. Adequate moisture in the wood chip media is maintained for proper growth of bacteria. For each waste pit ventilation fan servicing a waste storage facility that is identified as exhausting odorous and/or particulate laden air into the atmosphere, a separate biofilter is installed. Payment includes materials, equipment, and labor costs for installing the biofilter. A stabilized area around the biofilter is not included and must be addressed through the associated practice of Heavy Use Area Protection (561), if needed.

Before Situation:
One or more pit ventilation fans of a manure storage facility on a Headquarters site are exhausting odorous and/or particulate laden air into the atmosphere.

After Situation:
Air Quality resource concerns are addressed through installation of the practice by reducing odors and/or particulate matter emissions. Exhaust from a 24??? waste pit ventilation fan is piped to a 16??? wide by 20??? long by 4??? high horizontal biofilter constructed of a formed concrete bin that is filled with wood chip media, capable of handling 5,500 cubic feet per minute of airflow. The loading of odor and/or particulates into the air at the production facility is significantly reduced, resulting in a substantial improvement in air quality. Ammonia emissions are reduced approximately 60%; hydrogen sulfide about 80% and odor 60 to 80%.Associated practices include Heavy Use Area Protection (561), Amendments for Treatment of Agricultural Waste (591), Windbreak (380), Waste Storage Facility (313)and CAP-Comprehensive Air Quality Management Plan (126).

Feature Measure: Number of Biofilters Installed

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $22,779.18

Scenario Cost/Unit: $22,779.18

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	10	$5,012.50
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	11.3	$6,408.00
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	33	$83.16
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	8	$202.88
Aggregate, Wood Chips	1098	Includes materials, equipment and labor to transport and place.	Cubic Yards	$50.92	24	$1,222.08
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	2	$87.74
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	6	$172.26
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	11	$333.96
Pump, <= 5 HP, pump and motor, fixed cost portion	1009	Fixed cost portion of a pump less than or equal to 5 HP pump and motor. This portion is the base cost and is not dependent on horsepower. The total cost of any pump will include this fixed cost plus a variable cost portion. Includes the motor and controls for materials and shipping only.	Each	$1,659.42	1	$1,659.42
Pump, <= 5 HP, pump and motor, variable cost portion	1010	Variable cost portion of a pump less than or equal to 5 HP pump and motor. This portion is dependent on the total horsepower for the pump. The total cost of any pump will include this variable cost plus the fixed cost portion. Includes the motor and controls for materials and shipping only.	Horsepower	$447.82	0.25	$111.96
Dimension Lumber, Treated	1044	Treated dimension lumber with nominal thickness equal or less than 2 inches. Includes lumber and fasteners	Board Feet	$1.79	80	$143.20

Switches and Controls, programmable controller	1193	Programmable logic controller (with or without wireless telecommunications) commonly used to control pumps and irrigation systems	Each	$623.08	1	$623.08
Geotextile, non-woven, light weight	1209	Non-woven less than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	$2.08	36	$74.88
Pipe, HDPE, smooth wall, weight priced	1379	High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only.	Pound	$3.59	7.5	$26.93
Micro Irrigation, surface drip tubing	1488	Tubing is installed above ground for surface drip irrigation, and connections to the supply and flushing laterals. Tubing has emitters built in.	Feet	$0.35	100	$35.00
Articulated precast concrete block	1906	Articulated precast concrete blocks with a typical thickness of 4.5 to 6 inches. Includes materials and shipping.	Square Feet	$9.32	320	$2,982.40
Pipe, PVC, dia. => 18 in., weight priced	1958	Polyvinyl Chloride (PVC) Pipe priced by the weight of the pipe materials for pipes with diameters equal to or greater than 18 inch. Materials only.	Pound	$2.41	1292	$3,113.72
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 371 - Air Filtration and Scrubbing

Scenario: #25 - Wet Scrubber

Scenario Description:

Exhaust air from an animal barn passes through a wet scrubber to remove gaseous air pollutants (e.g., ammonia, volatile organic compounds, etc.) and/or dust. Ventilation system component alterations that may be needed to facilitate the scrubber application are not included in the cost component. Payment includes materials, equipment and labor costs for installing the scrubber. A stabilized area around the scrubber is not included and must be addressed through the associated practice of Heavy Use Area Protection (561), if needed. Resource concern: Air ??? Emissions of particulate matter/precursors, Air - Emissions of ozone precursors, Air - Objectionable Odors, Air ??? Reactive nitrogen

Before Situation:

The animal production operation has an animal barn with an uncontrolled airflow that is causing objectionable odors and emitting particulate matter and gaseous air pollutants, such as ammonia and volatile organic compounds.

After Situation:

A scrubber is installed on the exhaust side of each minimum ventilation fan via ducting. The scrubber is also equipped with a removable screen to filter feathers or other similar large particles. As exhaust air from the barn flows through the scrubbers, dust and gases are trapped on the filter media, reducing emissions of particulate matter (and precursors), ozone precursors, reactive nitrogen and objectionable odors. Associated practices include Heavy Use Area Protection (561), Waste Treatment (629), and Waste Transfer (634).

Feature Measure: Number of scrubbers

Scenario Unit: Each

Scenario Typical Size: 6.00

Scenario Total Cost: $1,449,323.04

Scenario Cost/Unit: $241,553.84

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	192	$8,423.04
Materials						
Wet Scrubber, multi-stage	2781	Multi-stage acid or water scrubber system for air filtration. Includes controls, wiring and associated appurtenances. Materials and shipping only.	Each	$240,150.00	6	$1,440,900.00

Practice: 371 - Air Filtration and Scrubbing

Scenario: #26 - Fan Exhaust Windbreak Wall

Scenario Description:
A windbreak wall (wood frame with a mesh screen) system with a switchgrass buffer is constructed around one or more exhaust fans from an animal barn to reduce emissions of dust, ammonia, and odors from the barn. Payment includes materials, equipment, and labor costs for constructing the windbreak wall and planting the switchgrass buffer. Resource concern: Air ??? Emissions of particulate matter/precursors, Air - Objectionable Odors, and Air ??? Reactive nitrogen.

Before Situation:
The animal production operation has a barn with an uncontrolled airflow that is causing objectionable odors and emitting particulate matter and ammonia.

After Situation:
A windbreak wall system with a switchgrass buffer is constructed around one or more exhaust fans to reduce emissions of dust, ammonia, and odors from the barn. The mesh screen removes dust and gases that are adhered to the dust, and the switchgrass buffer helps to filter additional dust and gases.

Feature Measure: Number of ventilation fans treated

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $1,359.36

Scenario Cost/Unit: $1,359.36

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	16	$459.36
Materials						
Post, Wood, CCA treated, 6 in. x 12-14 ft.	13	Wood Post, Line/End 6 inch dia. X 12-14 ft., CCA Treated. Includes materials and shipping only.	Each	$38.98	2	$77.96
Lumber, planks, posts and timbers, treated	1609	Treated dimension lumber with nominal thickness greater than 2 inches. Includes lumber and fasteners. Does not include labor.	Board Feet	$3.53	180	$635.40
Perennial Grass, Legume, and/or Forb Liners or Plugs, linear planting per 100 feet	2324	Perennial grasses, legumes and/or forbs established in a row using vegetative propagules including liners or plugs. Includes materials and shipping.	100 Foot	$858.60	0.1	$85.86
Plywood, 3/4 inch, treated	2363	Treated 4 x 8 ft. sheets of 3/4 inch exterior grade plywood	Each	$50.38	1	$50.38
Netting, Crop Protection, Fine mesh	2761	Synthetic netting fine mesh to exclude small insects. Includes materials and shipping only.	Square Feet	$0.14	360	$50.40

Practice: 371 - Air Filtration and Scrubbing

Scenario: #27 - Carbon Adsorber, Air System

Scenario Description:

Exhaust air from an animal production facility flows through an activated carbon bed that traps volatile organic compounds and other chemicals on its surface. Ventilation system component alterations that may be required to install the carbon adsorber are not included in the cost computation. Payment includes materials, equipment, and labor costs for installing the carbon adsorber. A stabilized area around the adsorber is not included and must be addressed through the associated practice of Heavy Use Area Protection (561), if needed. Resource concern: Air - Emissions of ozone precursors, Air - Objectionable Odors, Air ??? Reactive nitrogen

Before Situation:

An animal production operation has a facility with an uncontrolled airflow that is causing objectionable odors and emitting hydrogen sulfide, volatile organic compounds, and other gases.

After Situation:

Air from each minimum ventilation fan is ducted to a single carbon adsorber installed on the outside of the facility. As exhaust air flows through the adsorber, gases are trapped on the activated carbon beds, reducing emissions of precursors of hydrogen sulfide, volatile organic compounds, and objectionable odors. Associated practices include Heavy Use Area Protection (561), Waste Treatment (629), and Waste Transfer (634).

Feature Measure: Number of systems

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $148,503.84

Scenario Cost/Unit: $148,503.84

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	32	$1,403.84
Materials						
Air Filtration, Carbon Adsorption System	2782	Carbon adsorption system for air filtration. Includes controls, wiring and associated appurtenances. Materials and shipping only.	Each	$147,100.00	1	$147,100.00

Practice: 371 - Air Filtration and Scrubbing

Scenario: #28 - Biotrickling Filter, Air System

Scenario Description:

Exhaust air from an animal production facility flows through a biotrickling filter that removes hydrogen sulfide and other odorous gases. The filter uses a synthetic media to support the growth of microorganisms that convert hydrogen sulfide gas to a dilute acid solution, which is discharged via a continuous water overflow. Ventilation system component alterations that may be required to install the biotrickling filter are not included in the cost computation. Payment includes materials, equipment, and labor costs for installing the biotrickling filter. A stabilized area around the filter is not included and must be addressed through the associated practice of Heavy Use Area Protection (561), if needed. Resource concern: Air - Emissions of ozone precursors, Air - Objectionable Odors, Air ??? Reactive nitrogen

Before Situation:

An animal production operation has a facility with an uncontrolled airflow that is causing objectionable odors and emitting hydrogen sulfide, ammonia and other gases.

After Situation:

Air from each minimum ventilation fan is ducted to a single biotrickling filter installed on the outside of the facility. As exhaust air flows through the biotrickling filter, gases are degraded by microorganisms, reducing emissions of ammonia, hydrogen sulfide, and objectionable odors. Liquid containing essential nutrients is trickled over the filter and the harmful chemicals are carried away with this waste, allowing the clean air to be exhausted. Associated practices include Heavy Use Area Protection (561), Waste Treatment (629), and Waste Transfer (634).

Feature Measure: Number of systems

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $212,163.84

Scenario Cost/Unit: $212,163.84

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	32	$1,403.84
Materials						
Air Filtration, Biotrickling Filter	2783	Biotrickling filter for air filtration. Includes controls, wiring and associated appurtenances. Materials and shipping only.	Each	$210,760.00	1	$210,760.00

Practice: 371 - Air Filtration and Scrubbing

Scenario: #30 - Electrostatic Precipitator, In-Barn

Scenario Description:
An electrostatic precipitation system is installed inside an animal barn to charge and remove dust particles by causing the charged particles to stick to grounded surfaces such as gates, floors, and walls. These systems use suspended lines attached to a power supply which generates -30 kV DC at a low current level of up to 2 mA to ensure safety. Dust absorbs gases and can help transport gaseous and odorous compounds through building ventilation systems. Therefore, removal of dust (particulate matter) can also reduce overall emissions of reactive nitrogen and objectionable odors. Payment includes materials, equipment and labor costs for installing the electrostatic system. Resource concerns: Air ??? Emissions of particulate matter, Air ??? Emissions of reactive nitrogen, Air ??? Objectionable odors

Before Situation:
The animal barn has high concentrations of dust inside, resulting in emissions of dust and other gases from the barn.

After Situation:
An electrostatic precipitation system is installed in the barn. Dust in the air is charged by the discharge electrodes, then is removed via grounding to gates, floors, and walls.

Feature Measure: Number of systems

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $41,200.00

Scenario Cost/Unit: $41,200.00

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Air Filtration, Electrostatic Precipitator System, Indoor	2777	Indoor electrostatic precipitator system for air filtration. Includes controls, wiring and associated appurtenances. Materials and shipping only.	Square Feet	$2.06	20000	$41,200.00

Practice: 371 - Air Filtration and Scrubbing

Scenario: #41 - Electrostatic Precipitator, Outdoors

Scenario Description:
An electrostatic precipitation system is installed outside an animal barn to charge and remove dust particles emitted by the exhaust fans by causing charged dust particles to stick to a grounded fence. These systems use charged wires within a wall of geotextile fabric attached to metal frame fencing installed outside of the facility in front of the exhaust fans. Dust absorbs gases and can help transport gaseous and odorous compounds through building ventilation systems. Therefore, removal of dust (particulate matter) can also reduce overall emissions of reactive nitrogen and objectionable odors. Payment includes materials, equipment and labor costs for installing the electrostatic system. Resource concerns: Air ??? Emissions of particulate matter, Air ??? Emissions of reactive nitrogen, Air ??? Objectionable odors

Before Situation:
The animal barn has high concentrations of dust inside, resulting in emissions of dust and other gases from the barn.

After Situation:
An electrostatic precipitation system is installed outside of the barn. Dust from the fans is blown through the fence, where it is charged by electrodes on the corona wires, then is removed via grounding to the fence or the ground.

Feature Measure: Number of systems

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $15,978.00

Scenario Cost/Unit: $15,978.00

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Air Filtration, Electrostatic Precipitator System, Outdoor	2778	Outdoor electrostatic precipitator system for air infiltration. Includes controls, wiring, and associated appurtenances. Materials and shipping only.	Linear Feet	$159.78	100	$15,978.00

Practice: 372 - Combustion System Improvement

Scenario: #2 - Electric Motor in-lieu of IC Engine

Scenario Description:

Replace an existing IC engine with a new electric motor (12-74 HP). An existing IC engine is stationary or portable (does not propel a vehicle and is not an auxiliary IC engine on a vehicle). Examples of stationary or portable engines include diesel-fired pumping plant power units, emergency generators, or engines providing power for other agricultural systems. This replacement provides the greatest emission reductions by eliminating NOx, VOC, and PM emissions from the source. Resource Concerns: Air Quality Impacts - Emissions of Ozone Precursors; Air Quality Impacts - Emissions of Particulate Matter (PM) and PM Precursors; Inefficient Energy Use - Equipment and Facilities; Inefficient Energy Use - Farming/Ranching Practices and Field Operations.Associated Practices include: 374 - Farmstead Energy Improvement; 533 - Pumping Plant; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 442 - Sprinkler System; 447 - Irrigation System, Tailwater Recovery; 449 - Irrigation Water Management; 516 - Livestock Pipeline; 313 - Waste Storage Facility; 634 - Waste Transfer; 614 - Watering Facility; 642 - Water Well

Before Situation:

An old or inefficient IC engine provides power to an agricultural system, such as an irrigation pumping plant or grain dryer fan, or provides backup power generation for a farming operation. The emissions of oxides of nitrogen and/or particulate matter from the engine are identified to contribute to an air quality resource concern OR based on an evaluation of the engine, the pump, the well, and the center pivot irrigation system, the engine is less than 50 percent efficient in delivering water to the system.Air Quality Impacts: The existing internal combustion engine emissions are identified to contribute to an air quality resource concern.Inefficient Energy Use: The existing internal combustion engine uses excess fuel to provide power to an agricultural system.Plant Condition Impact (Irrigation system): Poor plant condition and vigor is evident due to a lack of water during critical times in the growing season.Water Quality Impacts (irrigation system): Fuel tank and fuel line have potential to cause environmental damage with leaks. The existing internal combustion engine is inefficient in delivering water to the system; subsequently, the lack of plant growth and uptake of nutrients, nitrogen and phosphorus are not being fully utilized and are available to be lost to surface and ground waters.

After Situation:

The electric motor replaces the existing older engine; the engine being replaced will be disabled and a certificate of inoperability submitted prior to certification of practice completion. The existing engine is supported by a concrete pad; no costs have been included for a new pad. Additional costs may be incurred if a concrete pad is not present. Typical replacement size is 40HP electric motor.For Air Quality: The electric motor does not produce any on-farm emissions of oxides of nitrogen or particulate matter, resulting in a substantial emissions reduction on the farm. For Energy: Energy efficiency will be improved by at least 20%.For Plant Condition (irrigation system): Plant condition and vigor will be improved. For Water Quality (irrigation system): The potential for environmental damage due to leaks from the tanks and fuel lines has been eliminated. Plant uptake of available nutrients will be increased and less nutrients will be lost to surface and ground waters.

Feature Measure: HP of replacement electric motor

Scenario Unit: Horsepower

Scenario Typical Size: 40.00

Scenario Total Cost: $6,073.77

Scenario Cost/Unit: $151.84

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	12	$526.44
Materials						
Motor, electric, NEMA Premium, 50 HP	1173	Premium NEMA approved electric motor, 50 Horsepower and all required appurtenances. Includes materials and shipping only.	Each	$5,547.33	1	$5,547.33

Practice: 372 - Combustion System Improvement

Scenario: #65 - IC Engine Repower, 50-99 bhp

Scenario Description:

Replace an existing older diesel engine with a new diesel engine (50-99 bhp) that is certified to the newest available U.S. EPA engine TIER rating. The existing diesel engine may be stationary or portable, but not mobile (e.g., providing motive power to tractors, trucks, etc.). Examples of stationary or portable engines include diesel-fired pumping plant power units, emergency generators, or engines providing power for other agricultural systems. Resource Concerns: Air Quality ??? Emissions of Particulate Matter (PM) and PM Precursors; Air Quality ??? Emissions of Ozone Precursors; Air Quality - Emissions of Airborne Reactive Nitrogen; Energy ??? Energy Efficiency of Equipment and Facilities. Associated Practices include: 374 ??? Energy Efficient Agricultural Operation; 533 ??? Pumping Plant; 430 ??? Irrigation Pipeline; 441 ??? Irrigation System, Microirrigation; 442 ??? Sprinkler System; 447 ??? Irrigation and Drainage Tailwater Recovery; 449 ??? Irrigation Water Management; 516 ??? Livestock Pipeline; 313 ??? Waste Storage Facility; 634 ??? Waste Transfer; 642 ??? Water Well; and 614 ??? Watering Facility.

Before Situation:

An old or inefficient diesel engine provides power to an agricultural system, such as an irrigation pumping plant or grain dryer fan, or provides backup power generation for a farming operation. Air Quality: The existing internal combustion engine emissions are identified to contribute to an air quality resource concern. Energy: The existing internal combustion engine uses excess fuel to provide power to an agricultural system.

After Situation:

The existing older diesel engine is replaced or repowered with a new diesel engine (50-99 bhp) that is certified to the newest available U.S. EPA engine TIER rating. The engine being replaced or repowered will be destroyed or disabled and a certificate of destruction or inoperability submitted prior to certification of practice completion. The existing engine is supported by a concrete pad; no costs have been included for a new pad. Additional costs may be incurred if an existing concrete pad is not present. Air Quality: The replacement or repower diesel engine will be cleaner-burning and will emit less particulate matter and/or oxides of nitrogen than the previous existing engine. The decrease in emissions for the replacement or repower engine must be supported by calculations showing the expected emissions reductions. Energy: Energy efficiency will be improved. The increase in energy efficiency for the replacement or repower engine must be supported by an energy analysis.

Feature Measure: Size of Replacement Engine

Scenario Unit: Brake Horse Power

Scenario Typical Size: 75.00

Scenario Total Cost: $14,818.42

Scenario Cost/Unit: $197.58

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	16	$701.92
Materials						
Motor, IC Engine, 50-99 HP	1429	Most current Tier-level Diesel or Cleaner Engine and required appurtenances. 50 to 99 bhp. Materials only.	Horsepower	$188.22	75	$14,116.50

Practice: 372 - Combustion System Improvement

Scenario: #66 - Mobile IC System/Tractor Replacement, 25-160 bhp

Scenario Description:

Replace an existing smaller (25-160 bhp engine size) high-emitting mobile off-road self-propelled diesel-powered agricultural tractor with a similarly-sized new lower emission mobile off-road tractor with a diesel engine that is certified to the newest available U.S. EPA engine TIER rating. The payment rate is based on the engine brake horsepower (bhp) rating of the engine in the new tractor and applies if the existing equipment cannot be repowered or retrofitted due to design constraints or operator safety.Resource Concerns: Air Quality - Emissions of Ozone Precursors; Air Quality - Emissions of Particulate Matter (PM) and PM Precursors; Air Quality - Emissions of Airborne Reactive Nitrogen.

Before Situation:

An older, higher-emitting diesel-powered tractor is used on an agricultural/forestry operation. The emissions of oxides of nitrogen and/or particulate matter are identified to contribute to an air quality resource concern.Air Quality: The existing diesel-powered tractor emissions are identified to contribute to an air quality resource concern.

After Situation:

A new lower-emitting mobile off-road diesel tractor replaces the existing higher-emitting system; the tractor being replaced will be disabled and a certificate of inoperability submitted prior to certification of practice completion.Air Quality: The new mobile off-road diesel tractor will be cleaner-burning and will emit less oxides of nitrogen and/or particulate matter than the previous existing tractor.

Feature Measure: Engine Size (bhp) of Engine in Repla

Scenario Unit: Brake Horse Power

Scenario Typical Size: 100.00

Scenario Total Cost: $69,047.00

Scenario Cost/Unit: $690.47

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Mobile IC System Replacement (<=160 bhp)	2698	Difference in costs of ownership and operation between existing mobile agricultural IC systems <= 160 bhp with no emissions reduction technology or early-generation emissions reduction technology and new mobile agricultural IC systems <=160 bhp with latest-tier emissions reduction technology.	Brake Horse Power	$690.47	100	$69,047.00

Practice: 372 - Combustion System Improvement

Scenario: #88 - Renewable Energy in-lieu of Fossil Fuel Power Source

Scenario Description:

Replace an agricultural combustion system with an electric system powered by an on-site renewable power source. An existing IC engine is stationary or portable (does not propel a vehicle and is not an auxiliary IC engine on a vehicle). Examples of agricultural combustion systems include diesel-fired pumping plant power units, emergency generators, or engines providing power for other agricultural systems. This replacement provides the greatest emission reductions by eliminating NOx, VOC, and PM emissions from the source. Additionally, electric systems are typically more energy efficient than combustion systems.Resource Concerns: Air Quality Impacts - Emissions of Ozone Precursors; Air Quality Impacts - Emissions of Particulate Matter (PM) and PM Precursors; Inefficient Energy Use - Equipment and Facilities; Inefficient Energy Use - Farming/Ranching Practices and Field Operations.Associated Practices include: 374 - Energy Efficient Agricultural Operation; 533 - Pumping Plant; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 442 - Sprinkler System; 447 - Irrigation System, Tailwater Recovery; 449 - Irrigation Water Management; 516 - Livestock Pipeline; 313 - Waste Storage Facility; 634 - Waste Transfer; 614 - Watering Facility; 642 - Water Well.

Before Situation:

An agricultural operation utilizes on-site fossil fuel combustion systems to supply power needed to run equipment associated with agricultural production, such as an irrigation pumping plant or grain dryer fan, or provides backup power generation for a farming operation. The emissions of oxides of nitrogen and/or particulate matter from the engine are identified to contribute to an air quality resource concern. Some of the operations that contribute to overall energy demand can include items such as irrigation equipment and pumps, grain handling and grain dryer systems. Air Quality Impacts: The existing internal combustion system emissions are identified to contribute to an air quality resource concern. Inefficient Energy Use: The existing internal combustion system is less efficient at providing power needed by the agricultural system than the renewable energy source. Plant Condition Impact: Poor plant condition and vigor is evident due to a lack of water during critical times in the growing season.Water Quality Impacts: Fuel tank and fuel line have potential to cause environmental damage with leaks. The existing internal combustion engine is inefficient in delivering water to the system; subsequently, the lack of plant growth and uptake of nutrients, nitrogen and phosphorus are not being fully utilized and are available to be lost to surface and ground waters.

After Situation:

The energy that was provided by a combustion system is instead provided by an electrical system with on-site solar power generation. A typical installation consists of 90 - 530W solar panels and appurtenances which generate roughly 40kW of on-site electricity. Panels are typically ground mounted in an array and costs include wiring and other appurtenances needed to collect power from the panels for use in the agricultural operation. The panels are typically installed by a four person crew over the course of 3 days. For Air Quality: The renewable energy power source does not produce any on-farm emissions of oxides of nitrogen or particulate matter, resulting in a substantial emissions reduction on the farm. For Energy: Energy efficiency will be improved.For Plant Condition: Plant condition and vigor will be improved. For Water Quality: The potential for environmental damage due to leaks from the tanks and fuel lines has been eliminated. Plant uptake of available nutrients will be increased and less nutrients will be lost to surface and ground waters.

Feature Measure: Kilowatt Capacity of Solar Array

Scenario Unit: Kilowatt

Scenario Typical Size: 40.00

Scenario Total Cost: $127,160.36

Scenario Cost/Unit: $3,179.01

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	40	$1,014.40
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	160	$7,019.20
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	80	$8,916.00
Materials						
Solar Panels, fixed cost portion	1031	Fixed cost portion of the Solar Panels. This portion is a base cost for all Solar Panels and is not dependent on Kilowatt. The total cost of any Solar Panels will include this fixed cost plus a variable cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drops and etc.).	Each	$859.26	1	$859.26
Solar Panels, variable cost portion	1135	Variable cost portion of the Solar Panels. This portion IS dependent on the total Kilowatt for the Solar Panels. The total cost of Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drop, etc.). Includes materials only.	Kilowatt	$2,563.62	40	$102,544.80
Variable Speed Drive, 50 HP	1288	Variable speed drive for 50 Horsepower electric motor. Does not include motor. Materials only.	Horsepower	$126.05	54	$6,806.70

Practice: 372 - Combustion System Improvement

Scenario: #97 - Tractor Replacement, Electric

Scenario Description:

Replace an existing high-emitting mobile off-road self-propelled diesel-powered tractor with a similarly-sized new electric tractor. The payment rate is based on the equivalent engine brake horsepower (bhp) rating of the electric motor of the new tractor.Resource Concerns: Air Quality - Emissions of Greenhouse Gases; Air Quality - Emissions of Ozone Precursors; Air Quality - Emissions of Particulate Matter (PM) and PM Precursors; Air Quality - Emissions of Airborne Reactive Nitrogen.

Before Situation:

An older, higher-emitting diesel-powered tractor is used for agricultural/forestry operations. The emissions of carbon dioxide, oxides of nitrogen, and/or particulate matter are identified to contribute to an air quality resource concern.Air Quality: The existing diesel-powered tractor emissions are identified to contribute to an air quality and atmospheric change resource concern.

After Situation:

A new electric tractor replaces the existing higher-emitting diesel tractor; the tractor being replaced will be disabled and a certificate of inoperability submitted prior to certification of practice completion.Air Quality: The new electric tractor will eliminate on-farm combustion emissions from the previous existing tractor.

Feature Measure: Equivalent Engine Size (bhp) of Rep

Scenario Unit: Horsepower

Scenario Typical Size: 70.00

Scenario Total Cost: $136,333.40

Scenario Cost/Unit: $1,947.62

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Mobile IC System Replacement-Electric Tractor	2871	Difference in costs of ownership and operation between existing diesel-powered tractors and new electric tractors.	Brake Horse Power	$1,947.62	70	$136,333.40

Practice: 374 - Energy Efficient Agricultural Operation

Scenario: #1 - Ventilation - Replacement of Conventional Exhaust Fan with High Efficiency Exhaust Fan

Scenario Description:

Replacement of a conventional exhaust fan with high efficiency exhaust fan on a one for one basis. Exhaust fans are typically used in tunnel or cross ventilation applications where air is being exchanged between inside and outside. Fans being installed should be models previously tested by BESS Lab or the Air Movement and Control Association and be in top 20 percentile of fans tested. Practice certification will be through receipts, pictures from the applicant, or signatures from a licensed installer. Typical scenario includes the replacement of a 48' fan.

Before Situation:

Inefficient ventilation in an agricultural building.

After Situation:

High-efficiency ventilation system which reduces energy use. The new ventilation equipment will provide suitable air quality and reduce overall power requirements (kW) compared to the existing ventilation system as evidenced in an energy audit. Associated practices/activities: may include 128 AgEMP, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a CAP 128 AgEMP or a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Each fan

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $2,260.63

Scenario Cost/Unit: $2,260.63

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	3	$131.61
Materials						
Fan, exhaust, 48 in. High Efficiency	1187	48 inch high efficiency exhaust fan, controls, wiring, and associated appurtenances. Materials only.	Each	$2,129.02	1	$2,129.02

Practice: 374 - Energy Efficient Agricultural Operation

Scenario: #2 - Ventilation - Replacement of Horizontal Air Flow Fan with Efficient HAF Fan

Scenario Description:

Replacement of a less efficient horizontal air flow fan with a more efficient HAF fan on a one for one basis. A system of fans are installed to create a horizontal air circulation pattern; the new system promotes efficient heat and moisture distribution. In a typical 10,000 square foot structure, 10 HAF fans are needed. Fan performance meets Energy Audit efficiency criteria as tested by AMCA or BESS Labs.

Before Situation:

Inefficent air circulation system in an enclosed agricultural production structure.

After Situation:

High-efficiency air circulation system which reduces energy use. The new equipment will provide suitable air quality and reduce overall power requirements (kW) compared to the existing system as evidenced in an energy audit. Associated practices/activities: may include 128 AgEMP and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a CAP 128 AgEMP or a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Each fan

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $287.39

Scenario Cost/Unit: $287.39

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	2	$87.74
Materials						
Fan, HAF, 1/10 to 1/15 HP	1189	High efficiency Horizontal Air Flow (HAF) fan, controls, wiring, and associated appurtenances. Materials only.	Each	$199.65	1	$199.65

Practice: 374 - Energy Efficient Agricultural Operation

Scenario: #6 - Water Heating - Compressor Heat Recovery

Scenario Description:
Install a compressor heat recovery unit to an existing refrigeration system in order to capture heat extracted from milk during the refrigeration process. This heat is used to preheat water, reducing the amount of additional energy that needs to be supplied by a hot water heater.

Before Situation:
A facility where heat from the refrigeration system is not captured to be utilized to preheat water.

After Situation:
Compressor heat recovery units reduce energy consumption, energy costs, and GHG emissions. The new equipment will reduce overall power requirements (kW) compared to the existing equipment as evidenced in an energy audit. Associated practices/activities: 128 AgEMP and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a CAP 128 AgEMP or a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Each Unit

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $6,202.79

Scenario Cost/Unit: $6,202.79

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	8	$350.96
Materials						
Compressor heat recovery (CHR) unit, High Efficiency	1899	Compressor heat recovery (CHR) units (insulated storage tanks with heat exchangers) added to a refrigeration system, use the heat extracted from a warm fluid (e.g., ??milk) that passes through the hot gas refrigerant line from the refrigeration system's compressors, to pre-heat water to approximately 110??F before it enters a conventional water heater.?? Energy savings comes from the reduced heating required in a water heater. Low ambient controls and/or condenser variable speed drives are part of the installation. The actual number of heat recovery units and their location will depend on the operating hours of the compressor and the configuration of the existing system.	Each	$5,851.83	1	$5,851.83

Practice: 374 - Energy Efficient Agricultural Operation

Scenario: #7 - Water Heating - High Efficiency or Tankless Water Heater

Scenario Description:
Replace existing low efficiency hot water heaters with a new high efficiency water heater or a tankless water heater on a one-to-one basis. High-efficiency hot water heaters include those with an energy rating of 0.9+ for electric and 0.8+ for natural gas. Tankless water heaters should be direct vented and fitted with a high temperature spin down filter.

Before Situation:
Facilities utilizing low efficiency hot water heaters

After Situation:
Higher efficiency or tankless hot water heaters reduce energy consumption, energy costs, and GHG emissions. These replacement systems can be fueled by natural gas or propane. The new equipment will reduce overall power requirements (kW) compared to the existing equipment as evidenced in an energy audit. Associated practices/activities: 128 AgEMP and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a CAP 128 AgEMP or a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $3,638.97

Scenario Cost/Unit: $3,638.97

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	8	$350.96
Materials						
Water Heater, High Efficiency	2485	Water heater with efficiency rating as per ASABE-S612. Includes materials and shipping only.	Each	$3,288.01	1	$3,288.01

Practice: 374 - Energy Efficient Agricultural Operation

Scenario: #9 - Washer - Extractor

Scenario Description:
Replace existing low efficiency laundry equipment with a new high efficiency washer-extractor on a one-to-one basis.

Before Situation:
Facilities utilizing low efficiency laundry equipment

After Situation:
Higher efficiency washer-extractor units reduce energy consumption, energy costs, and GHG emissions associated with laundry facilities at dairies. The new washer-extractor has a minimum Modified Energy Factor (MEF) of no lower than 2.2 (Cu.Ft./kWh)/cycle, and is typically a non-residential unit with a 30-40 lb dry load capacity. The new equipment will reduce overall power requirements (kW) compared to the existing equipment as evidenced in an energy audit. Associated practices/activities: 128 AgEMP and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a CAP 128 AgEMP or a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $10,570.46

Scenario Cost/Unit: $10,570.46

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	8	$350.96
Materials						
Washer Extractor	2489	Non-residential; 30 to 40 pound capacity (dry load); 4.3 - 6.0 cu.ft. (cylinder volume); minimum Modified Energy Factor (MEF) no lower than 2.2 (CuFt/kWh)/Cycle. Includes materials and shipping only.	Each	$10,219.50	1	$10,219.50

Practice: 374 - Energy Efficient Agricultural Operation

Scenario: #10 - Low Energy Livestock Waterers

Scenario Description:
Replace existing livestock waterers with a low energy livestock waterers on a one-to-one basis.

Before Situation:
Facilities utilizing low efficiency livestock waterers

After Situation:
Higher efficiency livestock waterers reduce energy consumption, energy costs, and GHG emissions. The new waterers will reduce overall power requirements (kW) compared to the existing equipment as evidenced in an energy audit. Associated practices/activities: CAP 128 AgEMP and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a CAP 128 AgEMP or a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $1,269.90

Scenario Cost/Unit: $1,269.90

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	3	$86.13
Materials						
Tank, Geothermal Tube Waterer	1062	Two head 18 gallon waterer. Includes materials and shipping only.	Each	$1,183.77	1	$1,183.77

Practice: 374 - Energy Efficient Agricultural Operation

Scenario: #11 - Variable Speed Drive Over 15 HP

Scenario Description:
The typical scenario consists of a variable speed drive (VSD) and appurtances, such as hook-ups, control panels, wiring, control blocks, filters, switches, pads, etc. attached to an electric motor used to drive a series of ventilation fans, an irrigation pump, or similar equipment involved with agricultural production.

Before Situation:
The system is inefficient when a motor operates at constant speed to satisfy a load which varies as to flow rate and/or pressure requirements.

After Situation:
An on-farm energy audit has determined that energy use can be reduced through use of a VSD to control electric motors. After the VSD is applied, the motor speed can be adjusted to reduce power requirements and better match varied flow or pressure requirements. Associated practices/activities: may include CAP 128 AgEMP and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a CAP 128 AgEMP or a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: VFD Horsepower

Scenario Unit: Horsepower

Scenario Typical Size: 50.00

Scenario Total Cost: $6,653.46

Scenario Cost/Unit: $133.07

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	8	$350.96
Materials						
Variable Speed Drive, 50 HP	1288	Variable speed drive for 50 Horsepower electric motor. Does not include motor. Materials only.	Horsepower	$126.05	50	$6,302.50

Practice: 374 - Energy Efficient Agricultural Operation

Scenario: #18 - Heating (Building)

Scenario Description:
Replace existing low efficiency heaters with new high efficiency heaters. High-efficiency heating systems include any heating unit with efficiency rating of 80%+ for fuel oil and 90%+ for natural gas and propane. Applications may be air heating/building environment and hydronic (boiler) heating for agricultural operations, including in floor heating, under bench, or root zone heating. An alternative to heater replacement might be the addition of climate control system and electronic temperature controls with +/- 1 degree F differential, to reduce the annual run time.

Before Situation:
Buildings heated with low efficiency heaters or heaters without proper electronic climate controls

After Situation:
Higher efficiency heaters reduce energy consumption, energy costs, and GHG emissions. These replacement systems can be fueled by natural gas, propane, or fuel oil. Associated practices/activities: CAP 128 AgEMP and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a CAP 128 AgEMP or a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Each Heater

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $3,451.92

Scenario Cost/Unit: $3,451.92

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	16	$701.92
Materials						
Heater, high efficiency	1165	Natural gas, propane, or fuel oil unit heater or boiler and venting materials. Based on input kBTU/hour. Includes materials and shipping only.	1,000 BTU/Hour	$22.00	125	$2,750.00

Practice: 374 - Energy Efficient Agricultural Operation

Scenario: #39 - Heating - Root Zone Heating

Scenario Description:

Replace forced air heating in a greenhouse with Radiant Tube heating, bench heating, or similar. Replacement will require the materials and labor to, re-plumb gas lines, and piping for new radiant tube heaters, and miscellaneous items to complete the installation. Alternate acceptable radiant heating systems can include radiant bench heating and quad radiant systems as evidenced by the energy audit. The typical scenario consists of an average greenhouse size of 30 ft wide x 100 ft long; tubing spaced 12' apart, minus walkway space ~ 20 tubes needed x 80 ft long = 1600 ft of tubing to provide radiant heat.

Before Situation:

Inefficient heat distribution equipment, such as forced air heaters. The radiant tube heating, bench heating or similar provides the heat needed at the plant root zone and not in the air. Radiant heating systems can lower heating cost 25 percent and saving energy.

After Situation:

Energy use is reduced through installation of a more efficient heating system. Radiant tube heating primarily warm objects directly over the tubes. As a result, radiant systems are typically installed at the floor level directly under the plants in a greenhouse. Associated practices/activities may include: CAP 128 AgEMP and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a CAP 128 AgEMP or a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Total length of tubing installed

Scenario Unit: Linear Feet

Scenario Typical Size: 1,600.00

Scenario Total Cost: $6,093.59

Scenario Cost/Unit: $3.81

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	32	$1,403.84
Materials						
Bench Matt Distribution Matrix and Manifolds	2457	Hot water distribution system for bench based rootzone heating system.	Square Feet	$7.49	80	$599.20
Insulation, Underbench	2459	Insulation, minimum of R8, for reducing heatloss from under rootzone heated bench. Includes materials and shipping only.	Square Feet	$1.43	1600	$2,288.00
In ground PEX tubing	2460	Piping used as part of hot water distribution system for in-ground rootzone heating. Includes materials and shipping only.	Feet	$0.33	1600	$528.00
Manifold and Valving (Valve Controllers)	2461	Valves and distribution manifolds (4 zones) used as part of a hot water distribution system for in-ground rootzone heating.?? Includes materials and shipping only.	Each	$78.32	4	$313.28
Switches and controls, greenhouse step controller	2463	Step controller and associated appurtenances. Part of an electronic environmental control system commonly used in greenhouses. Includes materials and shipping only.	Each	$961.27	1	$961.27

Practice: 374 - Energy Efficient Agricultural Operation

Scenario: #49 - Evaporator Wood-Fired, Air Injected

Scenario Description:

This practice is for the replacement of an inefficient evaporator with a new high efficiency evaporator with appurtenances. A high efficiency evaporator is designed to increase BTU output from the fuel source and provide a larger flue pan surface area to increase evaporation, thus reducing energy use. Wood-fired evaporator with air injection or forced draft includes stainless steel sides and bottom, blowers and stainless steel syrup and flue pans. A 3' x 12' high efficiency wood-fired evaporator with air injection or forced draft is common for moderately-sized maple operations.

Before Situation:

The evaporative process time for making concentrated maple syrup is extended and more fuel used because the inefficient evaporator requires more boiling to remove water from the sap.

After Situation:

The evaporative process time for making concentrated maple syrup is reduced by 50% or more and fuel efficiency by 15% or more over standard wood evaporator. Associated practices/activities: may include CAP 128-AgEMP and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a CAP 128 AgEMP or a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Square Foot of Unit

Scenario Unit: Square Feet

Scenario Typical Size: 36.00

Scenario Total Cost: $23,584.04

Scenario Cost/Unit: $655.11

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	4	$175.48
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	10	$287.10
Materials						
Evaporator, High efficiency, wood-fired, air injection, fixed cost	2268	High efficient wood fired evaporator with air injection used for maple syrup processing. Fixed cost portion. Materials only.	Each	$9,622.18	1	$9,622.18
Evaporator, High efficiency, wood-fired, air injection, variable cost	2269	High efficient wood fired evaporator with air injection used for maple syrup processing. Variable cost portion. Materials only.	Square Feet	$374.98	36	$13,499.28

Practice: 374 - Energy Efficient Agricultural Operation

Scenario: #50 - Evaporator Wood-Fired, Gasifier

Scenario Description:

This practice is for the replacement of an inefficient evaporator with a new high efficiency evaporator with appurtenances. A high efficiency evaporator is designed to increase BTU output from the fuel source and provide a larger flue pan surface area to increase evaporation, thus reducing energy use. Wood-fired gasifer evaporator includes stainless steel sides and bottom, blowers, and stainless steel syrup and flue pans. A 3' x 12 wood-fired gasifier evaporator is common for moderately-sized maple operations.

Before Situation:

The evaporative process time for making concentrated maple syrup is extended and more fuel used because the inefficient evaporator requires more boiling to remove water from the sap.

After Situation:

The evaporative process time for making concentrated maple syrup is reduced by 50% or more and fuel efficiency by 40% or more over standard wood evaporator. Associated practices/activities: may include CAP 128-AgEMP and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a CAP 128 AgEMP or a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Square Foot of Unit

Scenario Unit: Square Feet

Scenario Typical Size: 36.00

Scenario Total Cost: $42,014.46

Scenario Cost/Unit: $1,167.07

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	4	$175.48
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	10	$287.10
Materials						
Evaporator, High efficiency, wood-fired, gasification system, fixed cost	2266	High efficient wood fired gasification system used for maple syrup processing. Fixed cost portion. Materials only.	Each	$23,743.40	1	$23,743.40
Evaporator, High efficiency, wood-fired, gasification system, variable cost	2267	High efficient wood fired gasification system used for maple syrup processing. Variable cost portion. Materials only.	Square Feet	$494.68	36	$17,808.48

Practice: 374 - Energy Efficient Agricultural Operation

Scenario: #51 - Enhanced Preheater

Scenario Description:

The unit sets over the evaporator pan and uses steam from the evaporator pan to pre-heat the sap to as high as 200????F while at the same time injecting air into the sap to promote evaporation. Evaporation rates are increased by 65-75%, based on vendor analysis, leading to 40-43% energy savings. Sap is concentrated from Brix 2% to 4% or more before it enters the flue pan. Steam-enhanced systems require at least 9 feet from floor to ceiling. This scenario includes units <= 24 sq. ft, with installation. With increased evaporation, it takes less time to boil the sap down, thus saving significant energy (oil & wood fuel) used in the process, as well as labor. Typical scenario is for maple syrup preheating, but the scenario is potentially applicable to preheating for other processes or products as well.

Before Situation:

The evaporative process time for making concentrated maple syrup requires boiling ~20 gallons of sap to make 1 gallon of syrup, which means 19 gallons of water have to be boiled off, using more fuel and labor. A typical oil-fired evaporator consumes 3.5 to 4.5 gallons of fuel oil for each gallon of maple syrup produced.

After Situation:

The evaporative process time for making concentrated maple syrup requires boiling ~6 gallons of sap to make 1 gallon of syrup, which means 14 gallons of water were removed by the steam-enhanced system, using less fuel and labor. A typical oil-fired evaporator with a steam pan consumes 2.1 to 2.7 gallons of fuel oil for each gallon of maple syrup produced to remove water from the sap, improving the fuel efficiency and saving labor. Associated practices/activities: may include 128-AgEMP and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of a CAP 128 AgEMP or a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Square Foot of Steam Pan

Scenario Unit: Square Feet

Scenario Typical Size: 24.00

Scenario Total Cost: $19,852.49

Scenario Cost/Unit: $827.19

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	6	$263.22
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	6	$172.26
Materials						
Sap Pre-Heater, High efficiency, fixed cost	2254	High efficiency sap pre-heater device, fixed cost portion. Materials only.	Each	$9,954.77	1	$9,954.77
Sap Pre-Heater, High efficiency, variable cost	2255	High efficiency sap pre-heater device, variable cost portion. Materials only.	Square Feet	$394.26	24	$9,462.24

Practice: 374 - Energy Efficient Agricultural Operation

Scenario: #58 - Grain Aeration Floor System

Scenario Description:
A grain bin aeration floor system is installed as part of a grain drying system as supported by the energy audit and estimated savings in energy cost in the grain drying system. The typical system is a 27 ft diameter perforated full flooring system for 20 CFM/Bushel to be installed in a grain bin.

Before Situation:
Wet crop is loaded in the top of a horizontal, continuous dryer. Dried crop is augured from the bottom of the dryer. The heated air from the unit's burners passes from the burner plenum through the grain. An on-farm energy audit has identified energy savings by in bin aeration to achieve the desired final moisture content. Moisture content is based on measurement of grain leaving the dryer. The aeration system allows an additional 3% moisture removed from the grain after it leave the grain dryer.

After Situation:
Energy use is reduced through installation of a grain bin aeration floor system to reduce drying and total drying operations resulting in a 15% - 20% energy savings. Associated practices/activities may include: 128-AgEMP, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Square Foot of Flooring Installed

Scenario Unit: Square Feet

Scenario Typical Size: 573.00

Scenario Total Cost: $9,064.86

Scenario Cost/Unit: $15.82

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Grain Aeration Flooring System	2654	An aeration flooring system consisting of a prefabricated metal support structure overlain by perforated flooring panels. The system is installed in an existing grain dryer in order to provide greater airflow through the grain by allowing airflow through the suspended perforated floor.	Square Feet	$15.82	573	$9,064.86

Practice: 374 - Energy Efficient Agricultural Operation

Scenario: #68 - Reverse Osmosis >= 1000 GPH

Scenario Description:

A reverse osmosis (RO) unit, installed before the evaporator, filters the sap and removes ~ 75% of the water prior to getting to the evaporator. The unit is sized in gallons per hour. The size of the RO is determined based on the existing maple sugaring operation (number of taps and the capacity of the evaporator from prior 12 month Audit inventory). With a RO unit able to remove excess water, it takes less time to boil the sap down, thus saving significant energy (oil &wood fuel) used in the process. The RO unit will concentrate the sugar in the maple sap from its 2% to a level of 8%. At the 8% concentration a 75% energy savings can result. The RO system size is based on current taps and capacity. It does not account for any planned expansion in capacity or planned additional tapped trees for the next season. The system cost includes the RO unit, pump, vessel, membrane, wash tank, and installation. This scenario includes a RO unit that processes > 1000 gallons of sap per hour. Typical Scenario processes 1200 gallons of sap per hour. Associated practices to address thermal and low nutrient impacts of discharged water; 635- Vegetative Treatment Area, 629-Waste Treatment

Before Situation:

A maple sugaring operation uses an evaporator (pan over a furnace) to boil sap to remove water to create syrup. It takes ~20 gallons of sap to make 1 gallon of syrup, which means 19 gallons of water has to be boiled off. A typical oil-fired evaporator consumes 3.5 to 4.5 gallons of fuel oil for each gallon of maple syrup produced. No existing RO system used on operation.

After Situation:

With an efficient RO installed in the process, ~ 75% of the water is removed from the sap, thus cutting the boil time down by ~75%. An efficiency of 1 gallon fuel oil (or equivalent wood) per gallon of maple syrup is possible, thereby reducing energy consumption by 65-75%. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a CAP 128 AgEMP or a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Capacity of Unit

Scenario Unit: Gallons per Hour

Scenario Typical Size: 1,200.00

Scenario Total Cost: $26,381.82

Scenario Cost/Unit: $21.98

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	6	$263.22
Materials						
Reverse Osmosis unit, fixed cost portion	2224	Fixed cost portion of a reverse osmosis unit used for maple syrup processing. Materials only.	Each	$3,390.60	1	$3,390.60
Reverse Osmosis unit, variable cost portion	2225	Variable cost portion of a reverse osmosis unit used for maple syrup processing. Materials only.	Gallons per Hour	$18.94	1200	$22,728.00

Practice: 374 - Energy Efficient Agricultural Operation

Scenario: #71 - Plate Cooler Large

Scenario Description:
The installation of all stainless steel dual pass plate cooler, type 316 stainless steel with a 750 - 999 gallon / hour capacity. Practice certification will be through receipts and pictures from the applicant.

Before Situation:
Inefficient milk cooling (minimal pre-cooling of milk before entering the bulk tank).

After Situation:
High-efficiency milk cooling system which reduces energy use. The new milk cooling equipment will pre-cool the milk and reduce overall power requirements (kW) compared to the existing milk cooling system (where most of the cooling was accomplished in the bulk tank) as evidenced in an energy audit. Associated practices/activities: may include 128-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $36,696.22

Scenario Cost/Unit: $36,696.22

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	8	$350.96
Materials						
Plate Cooler, 750 - 999 gal/hr capacity	1178	Stainless Steel, dual pass plate cooler with 750 - 999 gallon/hour capacity. Includes materials and shipping only.	Each	$36,345.26	1	$36,345.26

Practice: 374 - Energy Efficient Agricultural Operation

Scenario: #72 - Scroll Compressor

Scenario Description:

Install a new scroll compressor, associated controls, wiring, and materials to retrofit an existing refrigeration system. A new condenser is not included in this typical scenario. Typical scenario includes a new 5 horsepower scroll compressor.

Before Situation:

Inefficient reciprocating compressor as a key component of the refrigeration system used to cool milk. The compressor is a critical part of a milk cooling system, affecting milk quality, system reliability, and system efficiency.

After Situation:

A more efficient scroll compressor, which will reduce energy use, is evidenced by the energy audit. A comparably sized scroll compressor provides refrigeration capacity at a higher efficiency than a reciprocating compressor. Newer scroll compressor systems typically reduce electricity use by 15 to 25 percent compared to reciprocating compressors. Associated practices/activities: may include 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Horse Power

Scenario Unit: Horsepower

Scenario Typical Size: 5.00

Scenario Total Cost: $3,526.83

Scenario Cost/Unit: $705.37

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	4	$175.48
Materials						
Scroll Compressor - 5 HP	1183	Scroll compressor, 5 Horsepower, controls, wiring, and appurtenances. Materials only.	Each	$3,351.35	1	$3,351.35

Practice: 374 - Energy Efficient Agricultural Operation

Scenario: #73 - Automatic Controller System

Scenario Description:

The typical scenario consists of an automatic control system installed on an existing manually controlled agricultural system. Typical components may include any of the following: wiring, sensors, data logger, logic controller, communication link, software, switches, and relay.

Before Situation:

A manually controlled system is existing in an agricultural facility that causes the inefficient use of energy, as evidenced by an on-farm energy audit.

After Situation:

An on-farm energy audit has determined that energy use can be reduced through use of an automatic controller that helps regulates the energy consumption of the existing system. Associated practices/activities may include: 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Each system

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $2,407.69

Scenario Cost/Unit: $2,407.69

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	8	$350.96
Materials						
Switches and Controls, temp sensors	1192	Temperature and soil moisture sensors installed as part of an electronic monitoring (with or without wireless telecommunications) commonly used to control pumps and irrigation systems	Each	$646.73	1	$646.73
Switches and Controls, programmable controller	1193	Programmable logic controller (with or without wireless telecommunications) commonly used to control pumps and irrigation systems	Each	$623.08	1	$623.08
Switches and Controls, Wi-Fi system and software	1194	Software with built-in cellular or Wi-Fi communication commonly used to control pumps and irrigation systems	Each	$786.92	1	$786.92

Practice: 374 - Energy Efficient Agricultural Operation

Scenario: #75 - Motor Upgrade > 1 and < 10 HP

Scenario Description:
The typical scenario consists of replacing an existing electric motor used to drive a ventilation fan, irrigation pumps, vacuum pump, or similar equipment involved with agricultural production with a new, high efficiency motor. The motor size is larger than 1 and less than 10 horsepower.

Before Situation:
The system is inefficient with a standard efficiency motor.

After Situation:
An on-farm energy audit has determined that energy use can be reduced through use of a NEMA premium efficiency motor. Associated practices/activities may include: 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Horsepower

Scenario Unit: Horsepower

Scenario Typical Size: 5.00

Scenario Total Cost: $1,211.90

Scenario Cost/Unit: $242.38

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	4	$175.48
Materials						
Motor, electric, NEMA Premium, 5 HP	1171	Premium NEMA approved electric motor, 5 Horsepower and all required appurtenances. Includes materials and shipping only.	Each	$1,036.42	1	$1,036.42

Practice: 374 - Energy Efficient Agricultural Operation

Scenario: #76 - Motor Upgrade = 1 HP

Scenario Description:
The typical scenario consists of replacing an existing electric motor used to drive a ventilation fan, irrigation pumps, vacuum pump, or similar equipment involved with agricultural production with a new, high efficiency motor. The motor size is less than or equal to 1 horsepower.

Before Situation:
The system is inefficient with a standard efficiency motor.

After Situation:
An on-farm energy audit has determined that energy use can be reduced through use of a NEMA premium efficiency motor. Associated practices/activities may include: 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $828.22

Scenario Cost/Unit: $828.22

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	4	$175.48
Materials						
Motor, electric, NEMA Premium, 1 HP	1169	Premium NEMA approved electric motor, 1 Horsepower and all required appurtenances. Includes materials and shipping only.	Each	$652.74	1	$652.74

Practice: 374 - Energy Efficient Agricultural Operation

Scenario: #77 - Heating - Radiant Systems

Scenario Description:

Replace 'pancake' Brood Heaters in a poultry house with Radiant Tube Heaters, or similar. Replacement will require the materials and labor to remove existing heating system, re-plumb gas lines, cables and wench system to retrofit new radiant tube heaters, and miscellaneous items to complete the installation. Alternate acceptable radiant heating systems can include radiant brooders and quad radiant systems as evidenced by the energy audit. The typical scenario consists of the replacement of 28 brood heaters with 6 radiant tube heaters.

Before Situation:

Inefficient heat distribution equipment, such as conventional 'pancake' brood heaters. The Pancake brooder, mounted at a low installation height, primarily warms the air. They provide a one-to-two foot perimeter at desired temperatures around each brooder. A large number of brooders are required to cover a significant percent of floor space. As the warmed air naturally rises it loses effectiveness for poultry on the ground.

After Situation:

Energy use is reduced through installation of a more efficient heater. Radiant tube heaters primarily warm objects within a direct line of sight (similar to the sun or an open fire). Air temperature is of relatively little importance for a radiant heating systems to be effective. As a result, radiant sytems are typically installed 5' or more above the floor level. This height extends the distribution of the radiant heat over a larger area than is possible with pancake style heaters. A roughly 16' diameter radiant heat zone heats over twice that of a convential pancake brooder. Associated practices/activities may include: 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 6.00

Scenario Total Cost: $11,061.22

Scenario Cost/Unit: $1,843.54

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	16	$701.92
Materials						
Heater, radiant tube	1163	Radiant tube heater rated at 125,000 BTU/hour. Materials only.	Each	$1,726.55	6	$10,359.30

Practice: 374 - Energy Efficient Agricultural Operation

Scenario: #80 - Reverse Osmosis > 250 and < 1000 GPH

Scenario Description:

A reverse osmosis (RO) unit, installed before the evaporator, filters the sap and removes ~ 75% of the water prior to getting to the evaporator. The unit is sized in gallons per hour. The size of the RO is determined based on the existing maple sugaring operation (number of taps and the capacity of the evaporator from prior 12 month Audit inventory). With a RO unit able to remove excess water, it takes less time to boil the sap down, thus saving significant energy (oil &wood fuel) used in the process. The RO unit will concentrate the sugar in the maple sap from its 2% to a level of 8%. At the 8% concentration a 75% energy savings can result. The RO system size is based on current taps and capacity. It does not account for any planned expansion in capacity or planned additional tapped trees for the next season. The system cost includes the RO unit, pump, vessel, membrane, wash tank, and installation. Typical Scenario processes 390 gallons of sap per hour. Associated practices to address thermal and low nutrient impacts of discharged water; 635- Vegetative Treatment Area, 629-Waste Treatment

Before Situation:

A maple sugaring operation uses an evaporator (pan over a furnace) to boil sap to remove water to create syrup. It takes ~20 gallons of sap to make 1 gallon of syrup, which means 19 gallons of water has to be boiled off. A typical oil-fired evaporator consumes 3.5 to 4.5 gallons of fuel oil for each gallon of maple syrup produced. No existing RO system used on operation.

After Situation:

With an efficient RO installed in the process, ~ 75% of the water is removed from the sap, thus cutting the boil time down by ~75%. An efficiency of 1 gallon fuel oil (or equivalent wood) per gallon of maple syrup is possible, thereby reducing energy consumption by 65-75%. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a CAP 128 AgEMP or a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Capacity of Unit

Scenario Unit: Gallons per Hour

Scenario Typical Size: 390.00

Scenario Total Cost: $11,040.42

Scenario Cost/Unit: $28.31

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	6	$263.22
Materials						
Reverse Osmosis unit, fixed cost portion	2224	Fixed cost portion of a reverse osmosis unit used for maple syrup processing. Materials only.	Each	$3,390.60	1	$3,390.60
Reverse Osmosis unit, variable cost portion	2225	Variable cost portion of a reverse osmosis unit used for maple syrup processing. Materials only.	Gallons per Hour	$18.94	390	$7,386.60

Practice: 374 - Energy Efficient Agricultural Operation

Scenario: #81 - Variable Speed Drive 15 HP or Less

Scenario Description:
The typical scenario consists of a variable speed drive (VSD) and appurtances, such as hook-ups, control panels, wiring, control blocks, filters, switches, pads, etc. attached to an electric motor used to drive a vacuum pump, milk transfer pump, or similar equipment involved with agricultural production.

Before Situation:
The system is inefficient when a motor operates at constant speed to satisfy a load which varies as to flow rate and/or pressure requirements.

After Situation:
An on-farm energy audit has determined that energy use can be reduced through use of a VSD to control electric motors. After the VSD is applied, the motor speed can be adjusted to reduce power requirements and better match varied flow or pressure requirements. Associated practices/activities: may include CAP 128 AgEMP and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a CAP 128 AgEMP or a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Each VSD Installed

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $1,678.39

Scenario Cost/Unit: $1,678.39

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	8	$350.96
Materials						
Variable Speed Drive, 10 HP	1287	Variable speed drive for 10 Horsepower electric motor. Does not include motor. Materials only.	Horsepower	$176.99	7.5	$1,327.43

Practice: 374 - Energy Efficient Agricultural Operation

Scenario: #82 - Plate Cooler-Small

Scenario Description:
The installation of all stainless steel dual pass plate cooler, type 316 stainless steel with less than or equal to 499 gallon / hour capacity. Practice certification will be through receipts and pictures from the applicant.

Before Situation:
Inefficient milk cooling (minimal pre-cooling of milk before entering the bulk tank).

After Situation:
High-efficiency milk cooling system which reduces energy use. The new milk cooling equipment will pre-cool the milk and reduce overall power requirements (kW) compared to the existing milk cooling system (where most of the cooling was accomplished in the bulk tank) as evidenced in an energy audit. Associated practices/activities: may include 128-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $5,635.89

Scenario Cost/Unit: $5,635.89

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	8	$350.96
Materials						
Plate Cooler, <= 499 gal/hr capacity	1176	Stainless Steel, dual pass plate cooler with < 499 gallon/hour capacity. Includes materials and shipping only.	Each	$5,284.93	1	$5,284.93

Practice: 374 - Energy Efficient Agricultural Operation

Scenario: #83 - Replace HAF Fan w/ Eff HAF fan greater than 20 inch dia. for animal housing

Scenario Description:

Within a livestock housing; replacement of a less efficient horizontal air flow fan with a more efficient HAF fan. A system of fans are installed to create a horizontal air circulation pattern; the new system promotes energy efficiency and better air flow distribution within the animal housing area. In a typical 300 ft long livestock housing building, 36??? HAF fans are to be installed on a one for one basis at 30 ft spacing between fans providing the needed cfm in accordance with ASABE criteria. Fan performance meets Energy Audit efficiency criteria as tested by AMCA or BESS Labs.

Before Situation:

Inefficient air mixing circulation system in a livestock housing structure.

After Situation:

High-efficiency air circulation system which reduces energy use. The new equipment will provide suitable air quality and reduce overall power requirements (kW) compared to the existing system as evidenced in an energy audit. Associated practices/activities: may include 128 AgEMP and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a CAP 128 AgEMP or a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Each Fan

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $555.31

Scenario Cost/Unit: $555.31

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	2	$87.74
Materials						
Fan, Horizontal, High Efficiency	2416	Horizontal air flow fan with a VER rating of at least 13 CFM/Watt. Includes materials only.	Each	$467.57	1	$467.57

Practice: 374 - Energy Efficient Agricultural Operation

Scenario: #84 - Motor Upgrade 10 - 100 HP

Scenario Description:
The typical scenario consists of replacing an existing electric motor used to drive a ventilation fan, irrigation pumps, vacuum pump, or similar equipment involved with agricultural production with a new, high efficiency motor. The motor size is equal to or larger than 10 and less than or equal to 100 horsepower.

Before Situation:
The system is inefficient with a standard efficiency motor.

After Situation:
An on-farm energy audit has determined that energy use can be reduced through use of a NEMA premium efficiency motor. Associated practices/activities may include: 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Horsepower

Scenario Unit: Horsepower

Scenario Typical Size: 50.00

Scenario Total Cost: $5,898.29

Scenario Cost/Unit: $117.97

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	8	$350.96
Materials						
Motor, electric, NEMA Premium, 50 HP	1173	Premium NEMA approved electric motor, 50 Horsepower and all required appurtenances. Includes materials and shipping only.	Each	$5,547.33	1	$5,547.33

Practice: 374 - Energy Efficient Agricultural Operation

Scenario: #85 - Reverse Osmosis <= 250 GPH

Scenario Description:

A reverse osmosis (RO) unit, installed before the evaporator, filters the sap and removes ~ 75% of the water prior to getting to the evaporator. The unit is sized in gallons per hour. The size of the RO is determined based on the existing maple sugaring operation (number of taps and the capacity of the evaporator from prior 12 month Audit inventory). With a RO unit able to remove excess water, it takes less time to boil the sap down, thus saving significant energy (oil &wood fuel) used in the process. The RO unit will concentrate the sugar in the maple sap from its 2% to a level of 8%. At the 8% concentration a 75% energy savings can result. The RO system size is based on current taps and capacity. It does not account for any planned expansion in capacity or planned additional tapped trees for the next season. The system cost includes the RO unit, pump, vessel, membrane, wash tank, and installation. Typical Scenario processes 245 gallons of sap per hour. Associated practices to address thermal and low nutrient impacts of discharged water; 635- Vegetative Treatment Area, 629-Waste Treatment

Before Situation:

A maple sugaring operation uses an evaporator (pan over a furnace) to boil sap to remove water to create syrup. It takes ~20 gallons of sap to make 1 gallon of syrup, which means 19 gallons of water has to be boiled off. A typical oil-fired evaporator consumes 3.5 to 4.5 gallons of fuel oil for each gallon of maple syrup produced. No existing RO system used on operation.

After Situation:

With an efficient RO installed in the process, ~ 75% of the water is removed from the sap, thus cutting the boil time down by ~75%. An efficiency of 1 gallon fuel oil (or equivalent wood) per gallon of maple syrup is possible, thereby reducing energy consumption by 65-75%. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a CAP 128 AgEMP or a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Capacity of Unit

Scenario Unit: Gallons per Hour

Scenario Typical Size: 245.00

Scenario Total Cost: $8,294.12

Scenario Cost/Unit: $33.85

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	6	$263.22
Materials						
Reverse Osmosis unit, fixed cost portion	2224	Fixed cost portion of a reverse osmosis unit used for maple syrup processing. Materials only.	Each	$3,390.60	1	$3,390.60
Reverse Osmosis unit, variable cost portion	2225	Variable cost portion of a reverse osmosis unit used for maple syrup processing. Materials only.	Gallons per Hour	$18.94	245	$4,640.30

Practice: 374 - Energy Efficient Agricultural Operation

Scenario: #86 - Plate Cooler Medium

Scenario Description:
The installation of all stainless steel dual pass plate cooler, type 316 stainless steel with a 500 - 749 gallon / hour capacity. Practice certification will be through receipts and pictures from the applicant.

Before Situation:
Inefficient milk cooling (minimal pre-cooling of milk before entering the bulk tank).

After Situation:
High-efficiency milk cooling system which reduces energy use. The new milk cooling equipment will pre-cool the milk and reduce overall power requirements (kW) compared to the existing milk cooling system (where most of the cooling was accomplished in the bulk tank) as evidenced in an energy audit. Associated practices/activities: may include 128-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $16,826.91

Scenario Cost/Unit: $16,826.91

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	8	$350.96
Materials						
Plate Cooler, 500 - 749 gal/hr capacity	1177	Stainless Steel, dual pass plate cooler with 500 - 749 gallon/hour capacity. Includes materials and shipping only.	Each	$16,475.95	1	$16,475.95

Practice: 374 - Energy Efficient Agricultural Operation

Scenario: #87 - High Velocity Animal Housing Circulation Fan

Scenario Description:

Replacement of a conventional circulation fan with high velocity efficient circulation fan in in the animal housing area. These high velocity circulation fans are typically used at dairy operations to keep the livestock cool from overheating during the warm summer months and improve cow comfort. Fans being installed should be models previously tested by BESS Lab or the Air Movement and Control Association and be in top 20 percentile of fans tested. At 0.1 in static pressure the min CFM/Watt should be 16.5 or greater. Practice certification will be through receipts and pictures from the applicant. Typical scenario includes a high velocity fan size between 36' -72' with blade guards.

Before Situation:

Inefficient air circulation in an animal housing building. Older conventional fans are high energy users and inefficient.

After Situation:

High-efficiency circulation system which reduces energy use. The new circulation equipment will provide suitable air quality and reduce overall power requirements (kW) compared to the existing fan circulation system as evidenced in an energy audit or energy assessment. Associated practices/activities: may include CAP 128- AgEMP, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612, or an energy assessment.

Feature Measure: Each Fan

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $1,115.77

Scenario Cost/Unit: $1,115.77

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	3	$131.61
Materials						
Fan, Circulation, Large Animal Housing	2673	Circulation Fan, High Efficiency, High Velocity 36 - 84 inch diameter with front and rear guards. Includes brackets and associated appurtenances. Materials and shipping..	Each	$984.16	1	$984.16

Practice: 374 - Energy Efficient Agricultural Operation

Scenario: #134 - Grain Dryer, <= 675 bushel capacity

Scenario Description:

A replacement continuous dryer rated for an appropriately rated bushel capacity for the operation that includes a microcomputer-based control system that adjusts the amount of time the crop remains in the dryer in order to achieve a consistent and accurate moisture content in the dried product. Alternate types of replacement dryers which reduce energy use are acceptable as evidenced by the energy audit.

Before Situation:

Wet crop is loaded in the top of a horizontal, continuous dryer. Dried crop is augured from the bottom of the dryer. The heated air from the unit's burners passes from the burner plenum through the grain. An on-farm energy audit has identified inefficient manual control of the dryer where the operator controls the plenum temperature and the discharge auger speed to achieve the desired final moisture content. Moisture content is based on measurement of grain leaving the dryer. The plenum temperature setting depends on the moisture content of crop with a typical value of 220 F. The burner cycles on and off, automatically, as necessary to maintain the plenum temperature selected by the operator.

After Situation:

Energy use is reduced through installation of a more efficient continuous dryer that uses a microcomputer-based controller to reduce over drying and total time of operation. Associated practices/activities may include: 120-Agriculture Energy Design, and other activities within 374-Energy Efficient Agricultural Operation. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Capacity of the dryer

Scenario Unit: Bushel

Scenario Typical Size: 500.00

Scenario Total Cost: $147,279.44

Scenario Cost/Unit: $294.56

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	12	$526.44
Materials						
Grain Dryer, Electric Drive, Fixed component	2873	Grain dryer powered by an internal electric moter, axial or centrifugal fan. Fixed cost portion of the component. Materials only.	Each	$102,248.00	1	$102,248.00
Grain Dryer, Electric Drive, Variable component	2874	Grain dryer powered by an internal electric moter, axial or centrifugal fan. Variable cost portion of the component based on bushel capacity. Materials only.	Bushel	$89.01	500	$44,505.00

Practice: 374 - Energy Efficient Agricultural Operation

Scenario: #135 - Grain Dryer, > 675-bushel capacity

Scenario Description:

A replacement continuous dryer rated for an appropriately rated bushel capacity for the operation that includes a microcomputer-based control system that adjusts the amount of time the crop remains in the dryer in order to achieve a consistent and accurate moisture content in the dried product. Alternate types of replacement dryers which reduce energy use are acceptable as evidenced by the energy audit.

Before Situation:

Wet crop is loaded in the top of a horizontal, continuous dryer. Dried crop is augured from the bottom of the dryer. The heated air from the unit's burners passes from the burner plenum through the grain. An on-farm energy audit has identified inefficient manual control of the dryer where the operator controls the plenum temperature and the discharge auger speed to achieve the desired final moisture content. Moisture content is based on measurement of grain leaving the dryer. The plenum temperature setting depends on the moisture content of crop with a typical value of 220 F. The burner cycles on and off, automatically, as necessary to maintain the plenum temperature selected by the operator.

After Situation:

Energy use is reduced through installation of a more efficient continuous dryer that uses a microcomputer-based controller to reduce over drying and total time of operation. Associated practices/activities may include: 120-Agriculture Energy Design, and other activities within 374-Energy Efficient Agricultural Operation. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Capacity of the dryer

Scenario Unit: Bushel

Scenario Typical Size: 1,500.00

Scenario Total Cost: $236,464.92

Scenario Cost/Unit: $157.64

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	16	$701.92
Materials						
Grain Dryer, Electric Drive, Fixed component	2873	Grain dryer powered by an internal electric moter, axial or centrifugal fan. Fixed cost portion of the component. Materials only.	Each	$102,248.00	1	$102,248.00
Grain Dryer, Electric Drive, Variable component	2874	Grain dryer powered by an internal electric moter, axial or centrifugal fan. Variable cost portion of the component based on bushel capacity. Materials only.	Bushel	$89.01	1500	$133,515.00

Practice: 376 - Field Operations Emissions Reduction

Scenario: #1 - One Crop Per Year

Scenario Description:

Utilize equipment that allows a reduction the tillage passes through the field and/or utilizing precision GPS guidance to avoid overlap of tillage passes across the field per crop rotation. Utilize this practice only when residue and STIR values cannot be achieved when using the associated Residue and Tillage Management Practices: 329-No Till or 345-Reduced Tillage to achieve the air quality resource concern. The resource concern addressed is improved air quality by reducing combustion and particulate matter emissions primarily from tillage. The scenario costs are based on tillage equipment or GPS technology to achieve reduce tillage passes.

Before Situation:

Tillage operations are performed individually; each operation requiring a tractor or other power implement to pull the tillage implement resulting in multiple passes across the field. Each pass creates soil particulate emissions contributing to the area's reduced air quality.

After Situation:

A 376 Field Operations Emissions Reduction plan is developed showing a reduced number of field passes across the field (benchmark system compared to the planned system). As a result of applying this practice soil particulates in the air is reduced and the area's air quality is improved.

Feature Measure: Acres Treated

Scenario Unit: Acres

Scenario Typical Size: 40.00

Scenario Total Cost: $904.40

Scenario Cost/Unit: $22.61

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acres	$22.61	40	$904.40

Practice: 376 - Field Operations Emissions Reduction

Scenario: #2 - Two Crops Per Year

Scenario Description:

Utilize equipment that allows a reduction of tillage passes through the field and/or precision GPS guidance to avoid overlap of tillage passes across the field per crop rotation. Utilize this practice only when residue and STIR values cannot be achieved when using the associated Residue and Tillage Management Practices: 329-No Till or 345-Reduced Tillage to achieve the air quality resource concern. The resource concern addressed is improved air quality by reducing combustion and particulate matter emissions primarily from tillage. The scenario cost is based on tillage equipment or GPS technology to achieve reduced tillage passes.

Before Situation:

Tillage operations are performed individually; each operation requiring a tractor or other power implement to pull the tillage implement resulting in multiple passes across the field. Each pass creates soil particulate emissions contributing to the area's reduced air quality.

After Situation:

A 376 Field Operations Emissions Reduction plan is developed showing a reduced number of field passes across the field (benchmark system compared to the planned system). As a result of applying this practice soil particulates in the air is reduced and the area's air quality is improved.

Feature Measure: Acres Treated

Scenario Unit: Acres

Scenario Typical Size: 40.00

Scenario Total Cost: $1,808.80

Scenario Cost/Unit: $45.22

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acres	$22.61	80	$1,808.80

Practice: 378 - Pond

Scenario: #1 - Excavated Pond without Pipe

Scenario Description:

A low-hazard water impoundment structure on agricultural lands to maintain or improve water quality and to provide water for livestock, fish and wildlife, recreation, fire control, developing renewable energy systems,and other related uses. Pond is created solely by excavation and impounds less than 3 feet against the embankment or spoil. Excavated material is spoiled, not placed in a designed embankment., and without a pipe. Earthen spillway is constructed as needed. The resource concerns addressed include inadequate livestock water, excessive suspended sediment and turbidity in surface water, damage from sediment deposition, and reduced capacity of conveyances by sediment deposition.

Before Situation:

Area exists where water could naturally pool or run off to create a pond for livestock, wildlife, fire control, developing renewable energy systems, and other related uses, and to maintain or improve water quality. Failure of the pond will not result in loss of life; damage to homes, commercial or industrial buildings, main highways, or railroads; or in interruption of the use or service of public utilities.

After Situation:

The typical pond is constructed by excavating 2500 cubic yards and spreading the spoil outside the pool area using a dozer or similar excavation equipment. Vegetation will be completed under critical area planting (342). Other associated practices include 382, 516, 521A, 533, 614, 587, 396, 570.

Feature Measure: Excavated Volume

Scenario Unit: Cubic Yards

Scenario Typical Size: 2,500.00

Scenario Total Cost: $16,562.85

Scenario Cost/Unit: $6.63

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Clearing and Grubbing	40	Clearing and Grubbing, includes materials, equipment and labor	Acres	$288.95	1	$288.95
Dozer, 200 HP	928	Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included.	Hours	$182.87	42	$7,680.54
Scraper, pull, 15 CY	1207	Pull type earthmoving scraper with 15 CY capacity. Does not include pulling equipment or labor. Add Tractor or Dozer, 260 HP typically required for single scraper.	Hours	$26.00	42	$1,092.00
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	42	$1,685.46
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement.	Cubic Yards	$136.88	29	$3,969.52
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	2	$1,846.38

Practice: 378 - Pond

Scenario: #5 - Embankment with Pipe

Scenario Description:

A low-hazard water impoundment structure on agricultural land maintain or to improve water quality and to provide water for livestock, fish and wildlife, recreation, fire control, developing renewable energy systems, and other related uses. An earthen embankment will be constructed with a principle spillway conduit and earthen auxiliary spillway, as designed. The resource concerns addressed include inadequate livestock water, excessive suspended sediment and turbidity in surface water, damage from sediment deposition, and reduced capacity of conveyances by sediment deposition.

Before Situation:

Area exists where water could naturally pool or run off to create a pond for livestock, wildlife, fire control, developing renewable energy systems, and other related uses, and to maintain or improve water quality. Failure of the embankment will not result in loss of life or damages of any kind.

After Situation:

The typical low hazard pond is constructed by excavating the pool area, constructing the auxiliary spillway, preparing the foundation as designed, and using 2500 cubic yards to create an embankment. The product of the storage times the effective height of the dam is less than 3,000. The effective height of the dam is 35 feet or less. A CMP principal spillway with rock riprap outlet protection will be provided. The vegetated auxiliary spillway will be constructed as designed. Vegetation will be completed under critical area planting (342). Other associated practices include 382, 516, 521, 533, 614, 587, 396, 570.

Feature Measure: Embankment Volume

Scenario Unit: Cubic Yards

Scenario Typical Size: 2,500.00

Scenario Total Cost: $25,904.11

Scenario Cost/Unit: $10.36

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Clearing and Grubbing	40	Clearing and Grubbing, includes materials, equipment and labor	Acres	$288.95	1	$288.95
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	142	$357.84
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	2500	$10,025.00
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	140	$875.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	20	$574.20
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement.	Cubic Yards	$136.88	50	$6,844.00
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	10.6	$305.92
Pipe, CMP, 18-16 gauge, weight priced	1322	18 and 16 gauge galvanized helical corrugated metal pipe priced by the weight of the pipe materials. Materials only.	Pound	$2.00	2400	$4,800.00
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 378 - Pond

Scenario: #82 - Embankment Pond without Pipe

Scenario Description:

A water impoundment structure on agricultural land to improve water quality or to provide water for livestock, fish and wildlife, recreation, fire control, crop and orchard irrigation, and other related uses. An earthen embankment will be constructed with an earthen auxiliary spillway. The resource concerns addressed include inadequate livestock water, excessive suspended sediment and turbidity in surface water, damage from sediment deposition, and reduced capacity of conveyances by sediment deposition.

Before Situation:

Area exists where water could naturally pool or run off to create a pond for livestock, wildlife, fire control or irrigation. Failure of the embankment will not result in loss of life or damages of any kind.

After Situation:

The typical pond is constructed by excavating the pool area, constructing the auxiliary spillway, preparing the foundation as designed, and using 3100 cubic yards to create an embankment. The product of the storage times the effective height of the dam is less than 3,000. The effective height of the dam is 35 feet or less. The earthen auxiliary spillway will be constructed as designed. No principle spillway pipe will be used. Vegetation will be completed under critical area planting (342). Other associated practices include 382, 516, 521A, 533, 614, 587, 396.

Feature Measure: Embankment Volume

Scenario Unit: Cubic Yards

Scenario Typical Size: 3,100.00

Scenario Total Cost: $6,380.23

Scenario Cost/Unit: $2.06

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$100.26	40	$4,010.40
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	40	$1,605.20
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 378 - Pond

Scenario: #83 - Embankment Pond with Pipe

Scenario Description:

A low-hazard water impoundment structure on agricultural land to improve water quality and to provide water for livestock, fish and wildlife, recreation, fire control, crop and orchard irrigation, and other related uses. An earthen embankment will be constructed with a principle spillway conduit and earthen auxiliary spillway, as designed. The resource concerns addressed include inadequate livestock water, excessive suspended sediment and turbidity in surface water, damage from sediment deposition, and reduced capacity of conveyances by sediment deposition.

Before Situation:

Area exists where water could naturally pool or run off to create a pond for livestock, wildlife, fire control or irrigation. Failure of the embankment will not result in loss of life or damages of any kind.

After Situation:

The typical low hazard pond is constructed by excavating the pool area, constructing the auxiliary spillway, preparing the foundation as designed, and using 3100 cubic yards to create an embankment. The product of the storage times the effective height of the dam is less than 3,000. The effective height of the dam is 35 feet or less. The principle spillway is installed using an approved conduit material. The earthen auxiliary spillway will be constructed as designed. Vegetation will be completed under critical area planting (342). Other associated practices include 382, 516, 521A, 533, 614, 587, 396.

Feature Measure: Embankment Volume

Scenario Unit: Cubic Yards

Scenario Typical Size: 3,100.00

Scenario Total Cost: $13,790.26

Scenario Cost/Unit: $4.45

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	3	$1,701.24
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	1.6	$4.03
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$100.26	48	$4,812.48
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	8	$350.96
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	48.5	$1,946.31
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	19.6	$565.66
Pipe, CMP, 18-16 gauge, weight priced	1322	18 and 16 gauge galvanized helical corrugated metal pipe priced by the weight of the pipe materials. Materials only.	Pound	$2.00	1662	$3,324.00
Trash Guard, metal	1608	Trash Guard, fabricated-steel, includes materials, equipment, and labor to transport and place Conical shaped trash guard for drop inlet spillway. Typically fabricated of CMP and steel. Includes materials, equipment, and labor to fabricate and transport.	Pound	$2.72	118	$320.96
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 379 - Forest Farming

Scenario: #10 - Canopy Treatment

Scenario Description:

Management of existing overstory tree canopy to enhance the structure, density and diversity within existing forests within an unmanaged or native forest stand. Canopy thinning, density, and patch structure will be determined by the desired shade/light requirements of understory crops and to meet landowner's desired future conditions. Overstory canopy trees to be thinned or removed will be marked and all activities are to be supervised by a certified Agroforester, Forester or qualified professional. Treatment of tree canopy conditions will be undertaken to reduce and open up existing canopy, requiring trained and skilled labor using chainsaws and other hand tools. Resource concerns include: Plant structure and composition; Plant productivity and health; Terrestrial habitat for wildlife and invertebrates; and, Sheet and rill erosion.

Before Situation:

Existing tree canopy structure, composition and plant condition is negatively affecting the resource setting. Canopy density shades out desired woody perennial, herbaceous, annual or cultural crop plants as well as native wildlife/pollinator plants. Landowner desires to manage resource setting to establish a multi-story cropping system, protect all resources and enhance/diversify production from trees and understory plants. Plant and soil ground cover is lacking and increases susceptibility of sheet and rill erosion from canopy through-fall and stem flow.

After Situation:

The typical resource setting is <1 ac to 5 ac, 2 ac is average. Existing tree and plant canopies are managed in combination to enhance landowner conservation and production. Management supports increased wildlife/native pollinators forage and nesting habitat. Onsite orientation and management of large stems, branches and leaves provides adequate ground cover, organic matter to enhance and sustain soil and protect setting from excessive soil erosion or runoff.

Feature Measure: Each

Scenario Unit: Acres

Scenario Typical Size: 2.00

Scenario Total Cost: $2,465.27

Scenario Cost/Unit: $1,232.64

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	6	$37.80
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	4	$101.44
Pruning tools, hand tools	1318	Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included.	Hours	$2.31	10	$23.10
Pruning tool, pole saw	1319	Gasoline powered pole chainsaw. Labor not included.	Hours	$9.80	6	$58.80
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	12	$526.44
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	22	$631.62
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	8	$891.60
Materials						
Tree Marking Paint	313	Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only.	Acres	$12.39	1	$12.39
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08

Practice: 379 - Forest Farming

Scenario: #11 - Native Tree Planting

Scenario Description:

Management of existing overstory tree canopy to enhance the structure, density and diversity within existing forests within an unmanaged or native forest stand. Native or non-native trees or shrubs are planted to enhance existing or degraded agroforest/forest farm conditions. Underplanting and spacing of trees or shrubs will be determined by the desired shade/light requirements and to meet landowner's desired future conditions for multi-story cropping and associated benefits. Tree and shrub planting sites and orientation and overstory canopy thinning and/or whole tree removals will be marked and supervised by a certified Agroforester, Forester or qualified professional. Treatment of tree canopy will be undertaken to reduce and open the existing canopy layers, requiring trained and skilled labor using chainsaws and other hand tools. Resource concerns include: Plant structure and composition; Plant productivity and health; Terrestrial habitat for wildlife and invertebrates; and, Sheet and rill erosion.

Before Situation:

Existing tree canopy structure, composition and plant condition is negatively affecting the resource setting. Canopy gaps allow significant sunlight onto the forest floor that affects shrub and other understory plant health. Canopy density shades out desired woody perennial, herbaceous, annual or cultural crop plants as well as native wildlife/pollinator plants. Landowner desires to manage resource setting to protect all resources and to enhance/diversify production. Plant and soil ground cover is lacking and increases susceptibility of sheet and rill erosion from canopy throughfall and stem flow.

After Situation:

The typical resource setting is <1ac to 5ac, 2ac is average. Existing tree and plant canopies are managed in combination to enhance landowner conservation and production. Management supports increased wildlife/native pollinators forage and nesting habitat. Onsite orientation and management of large stem, branches/leaves provides adequate ground cover, organic matter and woody material to enhance and sustain soil and protect setting from excessive soil erosion or runoff.

Feature Measure: Acres Treated

Scenario Unit: Acres

Scenario Typical Size: 2.00

Scenario Total Cost: $4,372.77

Scenario Cost/Unit: $2,186.39

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	6	$37.80
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	4	$101.44
Mechanical weed control, Vegetation termination	957	Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs.	Acres	$27.07	2	$54.14
Pruning tools, hand tools	1318	Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included.	Hours	$2.31	6	$13.86
Pruning tool, pole saw	1319	Gasoline powered pole chainsaw. Labor not included.	Hours	$9.80	4	$39.20
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$12.51	6	$75.06
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	10	$438.70
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	28	$803.88
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	8	$891.60
Materials						
Tree Marking Paint	313	Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only.	Acres	$12.39	1	$12.39
Shrub, Potted, Small	1524	Potted shrub seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$7.79	10	$77.90
Shrub, Potted, Medium	1527	Potted shrub seedling, 2 gallons or larger. Includes materials and shipping only.	Each	$14.34	10	$143.40
Tree, Hardwood, Potted, Small	1529	Potted hardwood seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$4.91	10	$49.10

Tree, Hardwood, Potted, Medium	1532	Potted hardwood seedling, 2 gallons or larger. Includes materials and shipping only.	Each	$14.28	10	$142.80
Tree, Hardwood, Potted, Medium	1532	Potted hardwood seedling, 2 gallons or larger. Includes materials and shipping only.	Each	$14.28	10	$142.80
Cable ties, plastic	1575	Plastic cable ties (typ. 8-12 in.) to assist in securing items. Materials only.	Each	$0.07	40	$2.80
Stakes, wood, 1 in. x 1 in. x 36 in.	1577	1 in. x 1 in. x 36 in. wood stakes to fasten items in place. Includes materials only.	Each	$1.01	20	$20.20
Fertilizer, tree, slow release, warm climate, 18-6-12	1593	Slow release fertilizer to gradually apply nutrients over time for tree establishment. 50 pound bag, 18-6-12 blend.	Pound	$2.04	100	$204.00
Native Perennial Grasses, Legumes and/or Forb Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, moderate commercial availability	2619	Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed is moderately easy to purchase commercially. Includes materials and shipping.	Acres	$469.81	2	$939.62
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08

Practice: 379 - Forest Farming

Scenario: #12 - Tree and Shrub Planting

Scenario Description:
Native or non-native trees or shrubs are hand-planted to enhance existing or degraded agroforest/forest farm conditions or to establish agroforest on cropland settings where shrubs, trees, and/or dwarf trees will grow. Planting site orientation and spacing will be marked by a certified Agroforester, Forester or qualified professional.??Resource concerns include:??Plant structure and composition; Plant productivity and health;Terrestrial habitat for wildlife and invertebrates; and,

Sheet and rill erosion.

Before Situation:
Existing overstory tree canopy is degraded or absent which negatively affects existing or planned plantings on the site. Shrub species exist and landowner desires to establish a tree overstory to improve growing conditions and diversity. Wildlife species are negatively impacted due to lack of connectivity to forests. Production and quality of agroforest products are less than desired.??Excessive sunlight exposure affects shrub and other understory plant health.??Exotic/invasive plants are an issue. Ground cover is lacking and sheet and rill erosion occurs during heavy rainfall events.

After Situation:
The typical Agroforest is <1 acres to 5 acres, 2 acres is average. Native or non-native trees were planted that will grow and provide shade for the existing managed shrubs and/or trees and to create habitat that will benefit terrestrial species.??Onsite management and orientation of stems, branches/leaves provides adequate ground cover, organic matter and woody material to enhance and sustain soil and protect setting from excessive soil erosion or runoff.

Feature Measure: Acres Treated

Scenario Unit: Acres

Scenario Typical Size: 2.00

Scenario Total Cost: $2,337.56

Scenario Cost/Unit: $1,168.78

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	2	$50.72
Mechanical weed control, Vegetation termination	957	Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs.	Acres	$27.07	2	$54.14
Pruning tools, hand tools	1318	Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included.	Hours	$2.31	6	$13.86
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$12.51	6	$75.06
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	10	$287.10
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	8	$891.60
Materials						
Shrub, Potted, Small	1524	Potted shrub seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$7.79	10	$77.90
Shrub, Potted, Medium	1527	Potted shrub seedling, 2 gallons or larger. Includes materials and shipping only.	Each	$14.34	10	$143.40
Tree, Hardwood, Potted, Small	1529	Potted hardwood seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$4.91	10	$49.10
Tree, Hardwood, Potted, Medium	1532	Potted hardwood seedling, 2 gallons or larger. Includes materials and shipping only.	Each	$14.28	10	$142.80
Tree, Hardwood, Potted, Medium	1532	Potted hardwood seedling, 2 gallons or larger. Includes materials and shipping only.	Each	$14.28	10	$142.80
Cable ties, plastic	1575	Plastic cable ties (typ. 8-12 in.) to assist in securing items. Materials only.	Each	$0.07	40	$2.80
Stakes, wood, 1 in. x 1 in. x 36 in.	1577	1 in. x 1 in. x 36 in. wood stakes to fasten items in place. Includes materials only.	Each	$1.01	20	$20.20
Fertilizer, tree, slow release, warm climate, 18-6-12	1593	Slow release fertilizer to gradually apply nutrients over time for tree establishment. 50 pound bag, 18-6-12 blend.	Pound	$2.04	100	$204.00
Mobilization						

Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08

Practice: 380 - Windbreak/Shelterbelt Establishment and Renovation

Scenario: #37 - 1 row windbreak, shrubs, hand planted

Scenario Description:
Single 500 foot row of shrubs for wind protection, wildlife habitat, or snow management. Shrubs planted by hand 4 feet apart. This practice is typically applied to crop, pasture or range lands. Resource Concerns to be addressed may include: Soil Erosion (wind); Excess/Insufficient Water (drifted snow, inefficient moisture management); Water Quality Degradation (excess nutrients in surface waters, excessive sediment in surface waters,); Degraded Plant Condition (undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food, cover/shelter, continuity); Inefficient Energy Use (facilities, farming/ranching practices and field operations).

Before Situation:
Agricultural field, livestock paddock, feedlot or farmstead needing protection from wind, additional wildlife food and cover, or management of snow deposition

After Situation:
Wind velocity suitably reduced to reduce soil erosion, or to manage snow deposition. Additional wildlife food and cover.

Feature Measure: length of windbreak row(s)

Scenario Unit: Feet

Scenario Typical Size: 500.00

Scenario Total Cost: $365.46

Scenario Cost/Unit: $0.73

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	2	$50.72
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$12.51	2	$25.02
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	2	$57.42
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	2	$97.20
Materials						
Shrub, Seedling, Small	1506	Bare root shrub seedling, 6 to 18 inches tall, includes containerized seedlings less than 10 cubic inches. Includes materials and shipping only.	Each	$1.06	125	$132.50
Wire flags	1586	Small vinyl flags attached to wire stakes, typically, 36 in. length, for marking tree rows	Each	$0.13	20	$2.60

Practice: 380 - Windbreak/Shelterbelt Establishment and Renovation

Scenario: #38 - 1 row windbreak, trees, hand planted

Scenario Description:
Single 500 foot row of conifer tree seedlings for wind protection, wildlife habitat, or snow management. Trees planted by hand 10 feet apart. This practice is typically applied to crop, pasture or range lands. Resource Concerns to be addressed may include: Soil Erosion (wind); Excess/Insufficient Water (drifted snow, inefficient moisture management); Water Quality Degradation (excess nutrients in surface waters, excessive sediment in surface waters,); Degraded Plant Condition (undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food, cover/shelter, continuity); Inefficient Energy Use (facilities, farming/ranching practices and field operations).

Before Situation:
Agricultural field, livestock paddock, feedlot or farmstead needing protection from wind, additional wildlife food and cover, or management of snow deposition

After Situation:
Wind velocity suitably reduced to reduce soil erosion, or to manage snow deposition. Additional wildlife food and cover.

Feature Measure: length of windbreak row(s)

Scenario Unit: Feet

Scenario Typical Size: 500.00

Scenario Total Cost: $167.78

Scenario Cost/Unit: $0.34

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	1	$25.36
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$12.51	1	$12.51
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	1	$28.71
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	1	$48.60
Materials						
Tree, Conifer, Seedling, Medium	1514	Containerized conifer seedlings, 8 or 10 cubic inches; or bare root conifer seedlings 1+1 (two-year old seedlings that grew one year in the original seedbed and another year in a transplant bed), or bare root seedlings 2+0 (two-year old seedlings grown in their original seedbed). Includes materials and shipping only.	Each	$1.00	50	$50.00
Wire flags	1586	Small vinyl flags attached to wire stakes, typically, 36 in. length, for marking tree rows	Each	$0.13	20	$2.60

Practice: 380 - Windbreak/Shelterbelt Establishment and Renovation

Scenario: #39 - 2-row windbreak, shrubs, machine planted

Scenario Description:

Two 500 foot rows of shrubs for wind protection, energy conservation, wildlife habitat, air quality, snow management or to provide a visual screen. Shrubs planted with a tree planting machine 4 feet apart in the row with rows 16 feet apart. This practice is typically applied to crop, pasture or range lands. Resource Concerns to be addressed include: Soil Erosion (wind); Excess/Insufficient Water (drifted snow, inefficient moisture management); Water Quality Degradation (excess nutrients in surface waters, pesticides transported to surface waters, excessive sediment in surface waters,); Degraded Plant Condition (undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food, cover/shelter, continuity); Livestock Production Limitation (inadequate shelter); Air Quality Impacts (emission of particulate matter, objectionable odors); Inefficient Energy Use (facilities, farming/ranching practices and field operations).

Before Situation:

Agricultural field, livestock paddock, feedlot or farmstead needing protection from wind, additional wildlife food and cover, odor mitigation, visual screen or management of snow deposition

After Situation:

Wind velocity suitably reduced to reduce soil erosion, energy loss or to manage snow deposition. Additional wildlife food and cover, mixing of odor plumes and visual screening.

Feature Measure: length of windbreak row(s)

Scenario Unit: Feet

Scenario Typical Size: 500.00

Scenario Total Cost: $445.53

Scenario Cost/Unit: $0.89

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	1	$25.36
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$36.34	1	$36.34
Mechanical tree planter	1600	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hours	$5.96	1	$5.96
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	1	$28.71
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	1	$30.36
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	1	$48.60
Materials						
Shrub, Seedling, Small	1506	Bare root shrub seedling, 6 to 18 inches tall, includes containerized seedlings less than 10 cubic inches. Includes materials and shipping only.	Each	$1.06	250	$265.00
Wire flags	1586	Small vinyl flags attached to wire stakes, typically, 36 in. length, for marking tree rows	Each	$0.13	40	$5.20

Practice: 380 - Windbreak/Shelterbelt Establishment and Renovation

Scenario: #40 - 2-row windbreak, trees, machine planted

Scenario Description:

Two 500 foot rows of hardwood trees for wind protection, energy conservation, wildlife habitat, air quality, snow management or to provide a visual screen. Trees planted with a tree planting machine 10 feet apart in the row with rows 16 feet apart. Herbivores (deer, rabbits, etc.) are NOT expected to browse tree seedlings, tree protection is not needed. This practice is typically applied to crop, pasture or range lands. Resource Concerns to be addressed include: Soil Erosion (wind); Excess/Insufficient Water (drifted snow, inefficient moisture management); Water Quality Degradation (excess nutrients in surface waters, pesticides transported to surface waters, excessive sediment in surface waters,); Degraded Plant Condition (undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food, cover/shelter, continuity); Livestock Production Limitation (inadequate shelter); Air Quality Impacts (emission of particulate matter, objectionable odors); Inefficient Energy Use (facilities, farming/ranching practices and field operations).

Before Situation:

Agricultural field, livestock paddock, feedlot or farmstead needing protection from wind, additional wildlife food and cover, odor mitigation, visual screen or management of snow deposition

After Situation:

Wind velocity suitably reduced to reduce soil erosion, energy loss or to manage snow deposition. Additional wildlife food and cover, mixing of odor plumes and visual screening.

Feature Measure: length of windbreak row(s)

Scenario Unit: Feet

Scenario Typical Size: 500.00

Scenario Total Cost: $450.86

Scenario Cost/Unit: $0.90

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	2	$50.72
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$36.34	2	$72.68
Mechanical tree planter	1600	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hours	$5.96	2	$11.92
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	2	$57.42
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	2	$60.72
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	2	$97.20
Materials						
Tree, Hardwood, Seedling, Small	1509	Bare root hardwood seedlings 6 to 18 inches tall; includes tropical containerized seedlings of 8 cubic inches or smaller. Includes materials and shipping only.	Each	$0.95	100	$95.00
Wire flags	1586	Small vinyl flags attached to wire stakes, typically, 36 in. length, for marking tree rows	Each	$0.13	40	$5.20

Practice: 380 - Windbreak/Shelterbelt Establishment and Renovation

Scenario: #41 - 2-row windbreak, trees, shelters, machine planted

Scenario Description:
Two 500 foot rows of hardwood tree seedlings for wind protection, energy conservation, wildlife habitat, air quality, snow management or to provide a visual screen. Trees planted with a tree planting machine 10 feet apart in the row with rows 16 feet apart. Environmental impacts are likely, so each tree must be protected with a rigid tube tree shelter. This practice is typically applied to crop, pasture or range lands. Resource Concerns to be addressed include: Soil Erosion (wind); Excess/Insufficient Water (drifted snow, inefficient moisture management); Water Quality Degradation (excess nutrients in surface waters, pesticides transported to surface waters, excessive sediment in surface waters,); Degraded Plant Condition (undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food, cover/shelter, continuity); Livestock Production Limitation (inadequate shelter); Air Quality Impacts (emission of particulate matter, objectionable odors); Inefficient Energy Use (facilities, farming/ranching practices and field operations).

Before Situation:
Agricultural field, livestock paddock, feedlot or farmstead needing protection from wind, additional wildlife food and cover, odor mitigation, visual screen or management of snow deposition

After Situation:
Wind velocity suitably reduced to reduce soil erosion, energy loss or to manage snow deposition. Additional wildlife food and cover, mixing of odor plumes and visual screening.

Feature Measure: length of windbreak row(s)

Scenario Unit: Feet

Scenario Typical Size: 500.00

Scenario Total Cost: $1,354.86

Scenario Cost/Unit: $2.71

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	2	$50.72
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$36.34	2	$72.68
Mechanical tree planter	1600	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hours	$5.96	2	$11.92
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	2	$57.42
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	2	$60.72
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	2	$97.20
Materials						
Tree, Hardwood, Seedling, Small	1509	Bare root hardwood seedlings 6 to 18 inches tall; includes tropical containerized seedlings of 8 cubic inches or smaller. Includes materials and shipping only.	Each	$0.95	100	$95.00
Tree shelter, solid tube type, 5 in. x 48 in.	1571	5 inch x 48 inch tree tube for protection from animal damage. Materials and shipping only.	Each	$5.29	100	$529.00
Cable ties, plastic	1575	Plastic cable ties (typ. 8-12 in.) to assist in securing items. Materials only.	Each	$0.07	150	$10.50
Stakes, wood, 3/4 in. x 3/4 in. x 60 in.	1583	3/4 in. x 3/4 in. x 60 in. wood stakes to fasten items in place. Includes materials only.	Each	$2.43	150	$364.50
Wire flags	1586	Small vinyl flags attached to wire stakes, typically, 36 in. length, for marking tree rows	Each	$0.13	40	$5.20

Practice: 380 - Windbreak/Shelterbelt Establishment and Renovation

Scenario: #42 - 3 or more row windbreak, shrub, machine planted

Scenario Description:

Three or more 500 foot rows of shrubs for wind protection, energy conservation, wildlife habitat, air quality, snow management. Shrubs planted with a tree planting machine, 4 feet apart in the row with rows 16 feet apart. This practice is typically applied to crop, pasture or range lands. Resource Concerns to be addressed include: Soil Erosion (wind); Excess/Insufficient Water (drifted snow, inefficient moisture management); Water Quality Degradation (excess nutrients in surface waters, pesticides transported to surface waters, excessive sediment in surface waters,); Degraded Plant Condition (undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food, cover/shelter, continuity); Livestock Production Limitation (inadequate shelter); Air Quality Impacts (emission of particulate matter, objectionable odors); Inefficient Energy Use (facilities, farming/ranching practices and field operations).

Before Situation:

Agricultural field, livestock paddock, feedlot or farmstead needing protection from wind, additional wildlife food and cover, odor mitigation, visual screening or management of snow deposition

After Situation:

Wind velocity suitably reduced to reduce soil erosion, energy loss or to manage snow deposition. Additional wildlife food and cover, mixing of odor plumes and visual screening.

Feature Measure: length of windbreak row(s)

Scenario Unit: Feet

Scenario Typical Size: 500.00

Scenario Total Cost: $931.29

Scenario Cost/Unit: $1.86

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	3	$76.08
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$36.34	3	$109.02
Mechanical tree planter	1600	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hours	$5.96	3	$17.88
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	3	$86.13
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	3	$91.08
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	3	$145.80
Materials						
Shrub, Seedling, Small	1506	Bare root shrub seedling, 6 to 18 inches tall, includes containerized seedlings less than 10 cubic inches. Includes materials and shipping only.	Each	$1.06	375	$397.50
Wire flags	1586	Small vinyl flags attached to wire stakes, typically, 36 in. length, for marking tree rows	Each	$0.13	60	$7.80

Practice: 380 - Windbreak/Shelterbelt Establishment and Renovation

Scenario: #43 - 3 or more row windbreak, trees, machine planted

Scenario Description:

Three or more 500 foot rows of trees for wind protection, energy conservation, wildlife habitat, air quality, snow management or to provide a visual screen. The outside rows are conifers the inside row(s) are hardwoods. Trees 10 feet apart with rows 16 feet apart, planted with a tree planting machine. Planted seedlings are not likely to be impacted by environmental stressors, so tree shelters are not needed. This practice is typically applied to crop, pasture or range lands. Resource Concerns to be addressed include: Soil Erosion (wind); Excess/Insufficient Water (drifted snow, inefficient moisture management); Water Quality Degradation (excess nutrients in surface waters, pesticides transported to surface waters, excessive sediment in surface waters,); Degraded Plant Condition (undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food, cover/shelter, continuity); Livestock Production Limitation (inadequate shelter); Air Quality Impacts (emission of particulate matter, objectionable odors); Inefficient Energy Use (facilities, farming/ranching practices and field operations).

Before Situation:

Agricultural field, livestock paddock, feedlot or farmstead needing protection from wind, additional wildlife food and cover, odor mitigation, visual screening or management of snow deposition

After Situation:

Wind velocity suitably reduced to reduce soil erosion, energy loss or to manage snow deposition. Additional wildlife food and cover, mixing of odor plumes and visual screening.

Feature Measure: length of windbreak row(s)

Scenario Unit: Feet

Scenario Typical Size: 500.00

Scenario Total Cost: $442.64

Scenario Cost/Unit: $0.89

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	2	$50.72
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$36.34	2	$72.68
Mechanical tree planter	1600	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hours	$5.96	2	$11.92
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	2	$57.42
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	2	$97.20
Materials						
Tree, Hardwood, Seedling, Small	1509	Bare root hardwood seedlings 6 to 18 inches tall; includes tropical containerized seedlings of 8 cubic inches or smaller. Includes materials and shipping only.	Each	$0.95	50	$47.50
Tree, Conifer, Seedling, Medium	1514	Containerized conifer seedlings, 8 or 10 cubic inches; or bare root conifer seedlings 1+1 (two-year old seedlings that grew one year in the original seedbed and another year in a transplant bed), or bare root seedlings 2+0 (two-year old seedlings grown in their original seedbed). Includes materials and shipping only.	Each	$1.00	100	$100.00
Wire flags	1586	Small vinyl flags attached to wire stakes, typically, 36 in. length, for marking tree rows	Each	$0.13	40	$5.20

Practice: 380 - Windbreak/Shelterbelt Establishment and Renovation

Scenario: #44 - 3 or more row windbreak, trees, shelters, machine planted

Scenario Description:

Three or more 500 foot rows of hardwood trees for wind protection, energy conservation, wildlife habitat, air quality, snow management or to provide a visual screen. Trees planted with a tree planting machine 10 feet apart in the row with rows 16 feet apart. Environmental impacts are likely, so each tree must be protected with a rigid tube tree shelter. This practice is typically applied to crop, pasture or range lands. Resource Concerns to be addressed include: Soil Erosion (wind); Excess/Insufficient Water (drifted snow, inefficient moisture management); Water Quality Degradation (excess nutrients in surface waters, pesticides transported to surface waters, excessive sediment in surface waters,); Degraded Plant Condition (undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food, cover/shelter, continuity); Livestock Production Limitation (inadequate shelter); Air Quality Impacts (emission of particulate matter, objectionable odors); Inefficient Energy Use (facilities, farming/ranching practices and field operations).

Before Situation:

Agricultural field, livestock paddock, feedlot or farmstead needing protection from wind, additional wildlife food and cover, odor mitigation, visual screen or management of snow deposition

After Situation:

Wind velocity suitably reduced to reduce soil erosion, energy loss or to manage snow deposition. Additional wildlife food and cover, mixing of odor plumes and visual screening.

Feature Measure: length of windbreak row(s)

Scenario Unit: Feet

Scenario Typical Size: 500.00

Scenario Total Cost: $1,669.46

Scenario Cost/Unit: $3.34

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	2	$50.72
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$36.34	2	$72.68
Mechanical tree planter	1600	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hours	$5.96	2	$11.92
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	2	$57.42
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	2	$60.72
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	2	$97.20
Materials						
Tree, Hardwood, Seedling, Small	1509	Bare root hardwood seedlings 6 to 18 inches tall; includes tropical containerized seedlings of 8 cubic inches or smaller. Includes materials and shipping only.	Each	$0.95	150	$142.50
Tree shelter, solid tube type, 5 in. x 48 in.	1571	5 inch x 48 inch tree tube for protection from animal damage. Materials and shipping only.	Each	$5.29	150	$793.50
Cable ties, plastic	1575	Plastic cable ties (typ. 8-12 in.) to assist in securing items. Materials only.	Each	$0.07	150	$10.50
Stakes, wood, 3/4 in. x 3/4 in. x 60 in.	1583	3/4 in. x 3/4 in. x 60 in. wood stakes to fasten items in place. Includes materials only.	Each	$2.43	150	$364.50
Wire flags	1586	Small vinyl flags attached to wire stakes, typically, 36 in. length, for marking tree rows	Each	$0.13	60	$7.80

Practice: 380 - Windbreak/Shelterbelt Establishment and Renovation

Scenario: #77 - Renovation-Supplemental hand planting with container or bare root stock

Scenario Description:

Parts of the windbreak being renovated have died, but it is not necessary to cut or mechanically remove the dead wood. Supplemental plantings of containerized or bare root trees/shrubs within the existing footprint of the windbreak will improve its effectiveness and longevity. The windbreak/shelterbelt is renovated through hand planting of containerized tree and/or shrub seedlings at a average spacing of 8' (shrubs 4'-6', deciduous/conifer trees 8'-12') within row and 15'-20' between rows. A windbreak width of 60' and length of 726' are used in calculations; this is equivalent to an area of 1 acre. For planting that expands the footprint of an existing windbreak, use scenarios for Windbreak/Shelterbelt Establishment.Resource concerns include: Plant pest pressure,Plant productivity and health,Inadequate livestock shelter,Wind erosion.

Before Situation:

The health of trees and/or shrubs in a windbreak/shelterbelt has degraded as plants age, or plants may have been damaged by weather events or pests, decreasing the effectiveness of the original windbreak design. Plants lack leaf cover, have dead branches, gaps with no live green material, or may be completely dead. Wind moves freely through areas that lack foliage.

After Situation:

The integrity of 726 linear feet (one acre) of windbreak/ shelterbelt has been restored and is functioning properly to reduce wind impacts to plants, animals, humans, and structures.

Feature Measure: Length of Renovation

Scenario Unit: Feet

Scenario Typical Size: 726.00

Scenario Total Cost: $2,162.32

Scenario Cost/Unit: $2.98

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	4	$101.44
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$12.51	18	$225.18
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	18	$516.78
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	2	$222.90
Materials						
Shrub, Seedling, Large	1508	Bare root shrub seedling, 36 to 60 inches tall; includes containerized seedlings larger than 20 cubic inches. Includes materials and shipping only.	Each	$4.01	36	$144.36
Tree, Hardwood, Seedling, Medium	1510	Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only.	Each	$1.74	36	$62.64
Tree, Conifer, Seedling, Large	1515	Containerized conifer seedlings, 15 or 20 cubic inches; or bare root conifer seedlings 2+1 (three-year old seedlings that grew two years in the original seedbed and another year in a transplant bed) or bare root seedlings 3+0 and older (three-year or older seedlings grown in their original seedbed, or transplanted seedlings). Includes materials and shipping only.	Each	$1.73	36	$62.28
Tree, Hardwood, Potted, Small	1529	Potted hardwood seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$4.91	36	$176.76
Tree, Conifer, Potted, Small	1534	Potted conifer seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$5.08	36	$182.88
Tree shelter, mesh tree tube, 24 in.	1555	24 inch tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only.	Each	$0.53	90	$47.70
Tree shelter, solid tube type, 3-1/4 in. x 30 in.	1560	3-1/4 inch x 30 inch tree tube for protection from animal damage. Materials and shipping only.	Each	$3.25	90	$292.50
Stakes, wood, 3/4 in. x 3/4 in. x 36 in.	1581	3/4 in. x 3/4 in. x 36 in. wood stakes to fasten items in place. Includes materials only.	Each	$1.17	90	$105.30

Stake, bamboo, 3/8 in. x 36 in.	1584	3/8 in. x 36 in. bamboo stakes to anchor items in place. Inlcudes materials and shipping only.	Each	$0.24	90	$21.60

Practice: 380 - Windbreak/Shelterbelt Establishment and Renovation

Scenario: #78 - Renovation - Tree/shrub removal with chainsaw followed by hand planting

Scenario Description:

Windbreak/shelterbelt renovation to remove and replace deteriorated, damaged, diseased, or unsuitable trees or shrubs. The treatment may include removal of entire rows, or removal of selected trees/shrubs in order to prepare for the necessary planting of replacement trees and shrubs within the footprint of an existing windbreak, to improve the health and function of the windbreak. Supplemental plantings of bare root and/or containerized trees/shrubs, of conifer and/or deciduous species, or mixtures, are applied to improve the effectiveness and longevity of the windbreak. Windbreak width of 60' and length of 726' are used in calculations; this is equivalent to an area of 1 acre. For planting that expands the footprint of an existing windbreak, use scenarios for Windbreak/Shelterbelt Establishment. Resource concerns include:

Plant pest pressure,Plant productivity and health,Inadequate livestock shelter,Wind erosion.

Before Situation:

The health of trees and/or shrubs in a windbreak/shelterbelt has degraded as plants age, or plants may have been damaged by weather events or pests, decreasing the effectiveness of the original windbreak design. Plants lack leaf cover, have dead branches, gaps with no live green material, or may be completely dead. Wind moves freely through areas that lack foliage.

After Situation:

The integrity of 726 linear feet (one acre) of windbreak/shelterbelt has been restored and is functioning properly to reduce wind impacts to plants, animals, humans, and structures.

Feature Measure: Length of Renovation

Scenario Unit: Feet

Scenario Typical Size: 726.00

Scenario Total Cost: $3,174.02

Scenario Cost/Unit: $4.37

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	10	$63.00
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	4	$101.44
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$12.51	18	$225.18
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	10	$438.70
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	28	$803.88
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	4	$445.80
Materials						
Shrub, Seedling, Large	1508	Bare root shrub seedling, 36 to 60 inches tall; includes containerized seedlings larger than 20 cubic inches. Includes materials and shipping only.	Each	$4.01	36	$144.36
Tree, Hardwood, Seedling, Medium	1510	Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only.	Each	$1.74	36	$62.64
Tree, Conifer, Seedling, Large	1515	Containerized conifer seedlings, 15 or 20 cubic inches; or bare root conifer seedlings 2+1 (three-year old seedlings that grew two years in the original seedbed and another year in a transplant bed) or bare root seedlings 3+0 and older (three-year or older seedlings grown in their original seedbed, or transplanted seedlings). Includes materials and shipping only.	Each	$1.73	36	$62.28
Tree, Hardwood, Potted, Small	1529	Potted hardwood seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$4.91	36	$176.76
Tree, Conifer, Potted, Small	1534	Potted conifer seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$5.08	36	$182.88

Tree shelter, mesh tree tube, 24 in.	1555	24 inch tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only.	Each	$0.53	90	$47.70
Tree shelter, solid tube type, 3-1/4 in. x 30 in.	1560	3-1/4 inch x 30 inch tree tube for protection from animal damage. Materials and shipping only.	Each	$3.25	90	$292.50
Stakes, wood, 3/4 in. x 3/4 in. x 36 in.	1581	3/4 in. x 3/4 in. x 36 in. wood stakes to fasten items in place. Includes materials only.	Each	$1.17	90	$105.30
Stake, bamboo, 3/8 in. x 36 in.	1584	3/8 in. x 36 in. bamboo stakes to anchor items in place. Inlcudes materials and shipping only.	Each	$0.24	90	$21.60

Practice: 380 - Windbreak/Shelterbelt Establishment and Renovation

Scenario: #79 - Renovation-Thinning or tree removal with Dozer (trees > 8 inches DBH) followed by hand planting

Scenario Description:

Windbreak/shelterbelt renovation to remove and replace deteriorated, damaged, diseased, or unsuitable trees or shrubs. The treatment may include removal of entire rows, or removal of selected trees/shrubs in order to prepare for the necessary planting of replacement trees and shrubs within the footprint of an existing windbreak, to improve the health and function of the windbreak. The treatment uses mechanized equipment to remove trees and/or shrubs with average DBH >8 inches. Trees and shrubs are cleared with a Dozer. All woody debris from cutting and pruning is either scattered and crushed, piled and crushed, chipped, or removed from the treatment area. Hand planting is used to replace the trees/shrubs that were removed, improving the effectiveness and longevity of the windbreak. Various types and combinations of plant materials may be used, including bare root and/or containerized trees/shrubs, and conifer and/or deciduous species or mixtures. Windbreak width of 60' and length of 726' are used in calculations; this is equivalent to an area of 1 acre. For planting that expands the footprint of an existing windbreak, use scenarios for Windbreak/Shelterbelt Establishment.Resource concerns include: Plant pest pressure,Plant productivity and health,Inadequate livestock shelter,Wind erosion.

Before Situation:

The health of trees and/or shrubs in a windbreak/shelterbelt has degraded as plants age, or plants may have been damaged by weather events or pests, decreasing the effectiveness of the original windbreak design. Plants lack leaf cover, have dead branches, gaps with no live green material, or may be completely dead. Wind moves freely through areas that lack foliage.

After Situation:

The integrity of 726 linear feet (one acre) of windbreak/ shelterbelt has been restored and is functioning properly to reduce wind impacts to plants, animals, humans, and structures.

Feature Measure: Length of Renovation

Scenario Unit: Feet

Scenario Typical Size: 726.00

Scenario Total Cost: $4,502.65

Scenario Cost/Unit: $6.20

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$100.26	8	$802.08
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	4	$101.44
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$12.51	18	$225.18
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	26	$746.46
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	8	$321.04
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	4	$445.80
Materials						
Shrub, Seedling, Large	1508	Bare root shrub seedling, 36 to 60 inches tall; includes containerized seedlings larger than 20 cubic inches. Includes materials and shipping only.	Each	$4.01	36	$144.36
Tree, Hardwood, Seedling, Medium	1510	Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only.	Each	$1.74	36	$62.64
Tree, Conifer, Seedling, Large	1515	Containerized conifer seedlings, 15 or 20 cubic inches; or bare root conifer seedlings 2+1 (three-year old seedlings that grew two years in the original seedbed and another year in a transplant bed) or bare root seedlings 3+0 and older (three-year or older seedlings grown in their original seedbed, or transplanted seedlings). Includes materials and shipping only.	Each	$1.73	36	$62.28
Tree, Hardwood, Potted, Small	1529	Potted hardwood seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$4.91	36	$176.76
Tree, Conifer, Potted, Small	1534	Potted conifer seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$5.08	36	$182.88

Tree shelter, mesh tree tube, 24 in.	1555	24 inch tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only.	Each	$0.53	90	$47.70
Tree shelter, solid tube type, 3-1/4 in. x 30 in.	1560	3-1/4 inch x 30 inch tree tube for protection from animal damage. Materials and shipping only.	Each	$3.25	90	$292.50
Stakes, wood, 3/4 in. x 3/4 in. x 36 in.	1581	3/4 in. x 3/4 in. x 36 in. wood stakes to fasten items in place. Includes materials only.	Each	$1.17	90	$105.30
Stake, bamboo, 3/8 in. x 36 in.	1584	3/8 in. x 36 in. bamboo stakes to anchor items in place. Inlcudes materials and shipping only.	Each	$0.24	90	$21.60
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 380 - Windbreak/Shelterbelt Establishment and Renovation

Scenario: #80 - Renovation-Thinning or tree/shrub removal with Skidsteer followed by machine planting

Scenario Description:

Windbreak/shelterbelt renovation to remove and replace deteriorated, damaged, diseased, or unsuitable trees or shrubs. The treatment may include removal of entire rows, or removal of selected trees/shrubs in order to prepare for the necessary planting of replacement trees and shrubs within the footprint of an existing windbreak, to improve the health and function of the windbreak. The treatment uses mechanized equipment to remove trees and/or shrubs with average DBH < 8 inches. Trees and shrubs are cleared by a Skidsteer with a tree shear or saw. All woody debris produced by cutting and pruning is either scattered and crushed, piled and crushed, chipped, or removed from the treatment area. Machine planting is used to replace the trees/shrubs that were removed, to improve the effectiveness and longevity of the windbreak. Various types and combinations of plant materials may be used, including bare root and/or containerized trees/shrubs, and conifer and/or deciduous species or mixtures. Windbreak width of 60' and length of 726' are used in calculations; this is equivalent to an area of 1 acre. For planting that expands the footprint of an existing windbreak, use scenarios for Windbreak/Shelterbelt Establishment.Resource concerns include: Plant pest pressure,Plant productivity and health,Inadequate livestock shelter,Wind erosion.

Before Situation:

The health of trees and/or shrubs in a windbreak/shelterbelt has degraded as plants age, or plants may have been damaged by weather events or pests, decreasing the effectiveness of the original windbreak design. Plants lack leaf cover, have dead branches, gaps with no live green material, or may be completely dead. Wind moves freely through areas that lack foliage.

After Situation:

The integrity of 726 linear feet (one acre) of windbreak/ shelterbelt has been restored and is functioning properly to reduce wind impacts to plants, animals, humans, and structures.

Feature Measure: Length of Renovation

Scenario Unit: Feet

Scenario Typical Size: 726.00

Scenario Total Cost: $2,652.16

Scenario Cost/Unit: $3.65

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$56.88	11	$625.68
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	2	$50.72
Mechanical tree planter	1600	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hours	$5.96	3	$17.88
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	11	$315.81
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	11	$333.96
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	4	$445.80
Materials						
Shrub, Seedling, Small	1506	Bare root shrub seedling, 6 to 18 inches tall, includes containerized seedlings less than 10 cubic inches. Includes materials and shipping only.	Each	$1.06	48	$50.88
Tree, Hardwood, Seedling, Small	1509	Bare root hardwood seedlings 6 to 18 inches tall; includes tropical containerized seedlings of 8 cubic inches or smaller. Includes materials and shipping only.	Each	$0.95	24	$22.80
Tree, Conifer, Seedling, Medium	1514	Containerized conifer seedlings, 8 or 10 cubic inches; or bare root conifer seedlings 1+1 (two-year old seedlings that grew one year in the original seedbed and another year in a transplant bed), or bare root seedlings 2+0 (two-year old seedlings grown in their original seedbed). Includes materials and shipping only.	Each	$1.00	24	$24.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 380 - Windbreak/Shelterbelt Establishment and Renovation

Scenario: #81 - Renovation - Thinning or tree/shrub removal with Skidsteer followed by hand planting

Scenario Description:

Windbreak/shelterbelt renovation to remove and replace deteriorated, damaged, diseased, or unsuitable trees or shrubs. The treatment may include removal of entire rows, or removal of selected trees/shrubs in order to prepare for the necessary planting of replacement trees and shrubs within the footprint of an existing windbreak, to improve the health and function of the windbreak. The treatment uses mechanized equipment to remove trees and/or shrubs with average DBH < 8 inches. Trees and shrubs are cleared by a Skidsteer with a tree sheer or saw. All slash material from cutting and pruning is either scattered and crushed, piled and crushed, chipped, or removed from the treatment area. Hand planting is used to replace the trees/shrubs that were removed, to improve the effectiveness and longevity of the windbreak. Various types and combinations of plant materials may be used, including bare root and/or containerized trees/shrubs, and conifer and/or deciduous species or mixtures. Windbreak width of 60' and length of 726' are used in calculations; this is equivalent to an area of 1 acre. For planting that expands the footprint of an existing windbreak, use scenarios for Windbreak/Shelterbelt Establishment.Resource concerns include: Plant pest pressure,Plant productivity and health,Inadequate livestock shelter,Wind erosion.

Before Situation:

The health of trees and/or shrubs in a windbreak/shelterbelt has degraded as plants age, or plants may have been damaged by weather events or pests, decreasing the effectiveness of the original windbreak design. Plants lack leaf cover, have dead branches, gaps with no live green material, or may be completely dead. Wind moves freely through areas that lack foliage.

After Situation:

The integrity of 726 linear feet (one acre) of windbreak/shelterbelt has been restored and is functioning properly to reduce wind impacts to plants, animals, humans, and structures.

Feature Measure: Length of Renovation

Scenario Unit: Feet

Scenario Typical Size: 726.00

Scenario Total Cost: $4,077.45

Scenario Cost/Unit: $5.62

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$56.88	8	$455.04
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	4	$101.44
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$12.51	18	$225.18
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	26	$746.46
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	8	$242.88
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	4	$445.80
Materials						
Shrub, Seedling, Large	1508	Bare root shrub seedling, 36 to 60 inches tall; includes containerized seedlings larger than 20 cubic inches. Includes materials and shipping only.	Each	$4.01	36	$144.36
Tree, Hardwood, Seedling, Medium	1510	Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only.	Each	$1.74	36	$62.64
Tree, Conifer, Seedling, Large	1515	Containerized conifer seedlings, 15 or 20 cubic inches; or bare root conifer seedlings 2+1 (three-year old seedlings that grew two years in the original seedbed and another year in a transplant bed) or bare root seedlings 3+0 and older (three-year or older seedlings grown in their original seedbed, or transplanted seedlings). Includes materials and shipping only.	Each	$1.73	36	$62.28
Tree, Hardwood, Potted, Small	1529	Potted hardwood seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$4.91	36	$176.76
Tree, Conifer, Potted, Small	1534	Potted conifer seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$5.08	36	$182.88

Tree shelter, mesh tree tube, 24 in.	1555	24 inch tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only.	Each	$0.53	90	$47.70
Tree shelter, solid tube type, 3-1/4 in. x 30 in.	1560	3-1/4 inch x 30 inch tree tube for protection from animal damage. Materials and shipping only.	Each	$3.25	90	$292.50
Stakes, wood, 3/4 in. x 3/4 in. x 36 in.	1581	3/4 in. x 3/4 in. x 36 in. wood stakes to fasten items in place. Includes materials only.	Each	$1.17	90	$105.30
Stake, bamboo, 3/8 in. x 36 in.	1584	3/8 in. x 36 in. bamboo stakes to anchor items in place. Inlcudes materials and shipping only.	Each	$0.24	90	$21.60
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 380 - Windbreak/Shelterbelt Establishment and Renovation

Scenario: #82 - Renovation-Thinning or tree removal with Dozer (trees > 8 inches DBH) followed by machine planting

Scenario Description:

Windbreak/shelterbelt renovation to remove and replace deteriorated, damaged, diseased, or unsuitable trees or shrubs. The treatment may include removal of entire rows, or removal of selected trees/shrubs in order to prepare for the necessary planting of replacement trees and shrubs within the footprint of an existing windbreak, to improve the health and function of the windbreak. The treatment uses mechanized equipment to remove trees and/or shrubs with average DBH > 8 inches. Trees and shrubs are cleared with a Dozer. All slash material from cutting and pruning is either scattered and crushed, piled and crushed, chipped, or removed from the treatment area. Machine planting is used to replace the trees/shrubs that were removed, to improve the effectiveness and longevity of the windbreak. Various types and combinations of plant materials may be used, including bare root and/or containerized trees/shrubs, and conifer and/or deciduous species or mixtures. Windbreak width of 60' and length of 726' are used in calculations; this is equivalent to an area of 1 acre. For planting that expands the footprint of an existing windbreak, use scenarios for Windbreak/Shelterbelt Establishment.Resource concerns include: Plant pest pressure,Plant productivity and health,Inadequate livestock shelter,Wind erosion.

Before Situation:

The health of trees and/or shrubs in a windbreak/shelterbelt has degraded as plants age, or plants may have been damaged by weather events or pests, decreasing the effectiveness of the original windbreak design. Plants lack leaf cover, have dead branches, gaps with no live green material, or may be completely dead. Wind moves freely through areas that lack foliage.

After Situation:

The integrity of 726 linear feet (one acre) of windbreak/ shelterbelt has been restored and is functioning properly to reduce wind impacts to plants, animals, humans, and structures.

Feature Measure: Length of Restoration

Scenario Unit: Feet

Scenario Typical Size: 726.00

Scenario Total Cost: $3,077.36

Scenario Cost/Unit: $4.24

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$100.26	8	$802.08
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$56.88	3	$170.64
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	2	$50.72
Mechanical tree planter	1600	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hours	$5.96	3	$17.88
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	11	$315.81
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	3	$91.08
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	8	$321.04
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	4	$445.80
Materials						
Shrub, Seedling, Small	1506	Bare root shrub seedling, 6 to 18 inches tall, includes containerized seedlings less than 10 cubic inches. Includes materials and shipping only.	Each	$1.06	48	$50.88
Tree, Hardwood, Seedling, Small	1509	Bare root hardwood seedlings 6 to 18 inches tall; includes tropical containerized seedlings of 8 cubic inches or smaller. Includes materials and shipping only.	Each	$0.95	24	$22.80
Tree, Conifer, Seedling, Medium	1514	Containerized conifer seedlings, 8 or 10 cubic inches; or bare root conifer seedlings 1+1 (two-year old seedlings that grew one year in the original seedbed and another year in a transplant bed), or bare root seedlings 2+0 (two-year old seedlings grown in their original seedbed). Includes materials and shipping only.	Each	$1.00	24	$24.00
Mobilization						

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 380 - Windbreak/Shelterbelt Establishment and Renovation

Scenario: #83 - Renovation - Sod Release

Scenario Description:

Renovation to reduce competition from grass sod around trees/shrubs within a windbreak/shelterbelt. Apply appropriate herbicide to stress or kill competing sod vegetation between and/or within tree/shrub rows. The herbicide application is completed to significantly reduce competition from sod (grass) in the windbreak. Use WIN-PST or equivalent approved tool to evaluate herbicide impacts. Windbreak width of 60' and length of 726' are used in calculations, resulting in an area of 1 acre.

Before Situation:

The health of an existing windbreak/shelterbelt is deteriorating due to competition with grass sod. Trees/shrubs are dying or growth rate is reduced, and the windbreak/shelterbelt is not functioning as intended.

After Situation:

The integrity of 726 linear feet (one acre) of windbreak/ shelterbelt has been restored and it is functioning properly to reduce wind impacts to plants, animals, humans, and structures.

Feature Measure: Length of Renovation

Scenario Unit: Feet

Scenario Typical Size: 726.00

Scenario Total Cost: $439.18

Scenario Cost/Unit: $0.60

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	1	$6.73
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	1	$111.45
Materials						
Herbicide, Sethoxydim	339	A selective post emergence herbicide used to control annual and perennial grass weeds. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$17.06	1	$17.06
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 380 - Windbreak/Shelterbelt Establishment and Renovation

Scenario: #123 - Hand Planted, Potted

Scenario Description:
Single 600 foot row of potted shrubs, conifers, hardwoods, or combination for wind protection, wildlife habitat, or snow management. Shrubs will beplanted with a spacing of 4 to 6 feet and hardwoods/conifers 8 to 12 feet apart. The scenario will include 1/3 shrubs, 1/3 hardwoods, and 1/3 conifers based on feet of trees.This practice is typically applied to crop, pasture or range lands. Resource Concerns to be addressed may include: Soil Erosion (wind); Excess/Insufficient Water (driftedsnow, inefficient moisture management); Water Quality Degradation (excess nutrients in surface waters, excessive sediment in surface waters,); Degraded Plant Condition(undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food, cover/shelter, continuity); Inefficient Energy Use (facilities, farming/ranchingpractices and field operations).

Before Situation:
Agricultural field, livestock paddock, feedlot or farmstead needing protection from wind, additional wildlife food and cover, or management of snow deposition

After Situation:
Wind velocity suitably reduced to minimize soil erosion, or to manage snow deposition. Additional wildlife food and cover.

Feature Measure: Number of trees

Scenario Unit: Each

Scenario Typical Size: 80.00

Scenario Total Cost: $691.73

Scenario Cost/Unit: $8.65

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	1	$25.36
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$12.51	3	$37.53
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	4	$114.84
Materials						
Shrub, Potted, Small	1524	Potted shrub seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$7.79	40	$311.60
Tree, Hardwood, Potted, Small	1529	Potted hardwood seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$4.91	20	$98.20
Tree, Conifer, Potted, Small	1534	Potted conifer seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$5.08	20	$101.60
Wire flags	1586	Small vinyl flags attached to wire stakes, typically, 36 in. length, for marking tree rows	Each	$0.13	20	$2.60

Practice: 380 - Windbreak/Shelterbelt Establishment and Renovation

Scenario: #128 - Hand Planted, Bare Root

Scenario Description:
Single 600 foot row of bare root shrubs, conifers, hardwoods, or combination for wind protection, wildlife habitat, or snow management. Shrubs willbe planted with a spacing of 4 to 6 feet and hardwoods/conifers 8 to 12 feet apart. The scenario will include 1/3 shrubs, 1/3 hardwoods, and 1/3 conifers based on feet oftrees. This practice is typically applied to crop, pasture or range lands. Resource Concerns to be addressed may include: Soil Erosion (wind); Excess/Insufficient Water(drifted snow, inefficient moisture management); Water Quality Degradation (excess nutrients in surface waters, excessive sediment in surface waters,); Degraded PlantCondition (undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food, cover/shelter, continuity); Inefficient Energy Use (facilities,farming/ranching practices and field operations).

Before Situation:
Agricultural field, livestock paddock, feedlot or farmstead needing protection from wind, additional wildlife food and cover, or management of snowdeposition

After Situation:
Wind velocity suitably reduced to minimize soil erosion, or to manage snow deposition. Additional wildlife food and cover.

Feature Measure: Number of trees

Scenario Unit: Each

Scenario Typical Size: 80.00

Scenario Total Cost: $219.31

Scenario Cost/Unit: $2.74

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	1	$25.36
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$12.51	2	$25.02
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	3	$86.13
Materials						
Shrub, Seedling, Small	1506	Bare root shrub seedling, 6 to 18 inches tall, includes containerized seedlings less than 10 cubic inches. Includes materials and shipping only.	Each	$1.06	40	$42.40
Tree, Hardwood, Seedling, Small	1509	Bare root hardwood seedlings 6 to 18 inches tall; includes tropical containerized seedlings of 8 cubic inches or smaller. Includes materials and shipping only.	Each	$0.95	20	$19.00
Tree, Conifer, Seedling, Small	1512	Containerized conifer seedlings, 4 or 6 cubic inches; or bare root conifer seedlings 1+0 (one-year old seedlings grown in their original seedbed). Includes materials and shipping only.	Each	$0.94	20	$18.80
Wire flags	1586	Small vinyl flags attached to wire stakes, typically, 36 in. length, for marking tree rows	Each	$0.13	20	$2.60

Practice: 380 - Windbreak/Shelterbelt Establishment and Renovation

Scenario: #129 - Trees, machine planted, wildlife protection (tubes)

Scenario Description:
Tree planting consisting of 2500 feet of trees for wind protection, energy conservation, wildlife habitat, air quality, snow management or to provide avisual screen. The planting may consist of shrubs, hardwood trees, conifers, or a combination. Trees and shrubs planted with a tree planting machine. Shrubs will be plantedwith a spacing of 4 to 6 feet and hardwoods/conifers 8 to 12 feet apart in the row with rows 16 feet apart. The scenario will include 1/4 shrubs, 1/2 hardwoods, and 1/4conifers based on feet of trees. Herbivore (deer, rabbits, etc.) damage is likely, so each tree must be protected with a rigid tube tree shelter. This practice is typically appliedto crop, pasture or range lands. Resource Concerns to be addressed include: Soil Erosion (wind); Excess/Insufficient Water (drifted snow, inefficient moisture management);Water Quality Degradation (excess nutrients in surface waters, pesticides transported to surface waters, excessive sediment in surface waters,); Degraded Plant Condition(undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food, cover/shelter, continuity); Livestock Production Limitation (inadequate shelter); AirQuality Impacts (emission of particulate matter, objectionable odors); Inefficient Energy Use (facilities, farming/ranching practices and field operations).

Before Situation:
Agricultural field, livestock paddock, feedlot or farmstead needing protection from wind, additional wildlife food and cover, odor mitigation, visual screen or management of snow deposition

After Situation:
Wind velocity suitably reduced to minimize soil erosion, energy loss or to manage snow deposition. Additional wildlife food and cover, mixing of odor plumes and visual screening.

Feature Measure: Number of trees

Scenario Unit: Each

Scenario Typical Size: 344.00

Scenario Total Cost: $2,814.81

Scenario Cost/Unit: $8.18

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	4	$101.44
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$36.34	3	$109.02
Mechanical tree planter	1600	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hours	$5.96	3	$17.88
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	14	$401.94
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	3	$91.08
Materials						
Shrub, Seedling, Small	1506	Bare root shrub seedling, 6 to 18 inches tall, includes containerized seedlings less than 10 cubic inches. Includes materials and shipping only.	Each	$1.06	156	$165.36
Tree, Hardwood, Seedling, Small	1509	Bare root hardwood seedlings 6 to 18 inches tall; includes tropical containerized seedlings of 8 cubic inches or smaller. Includes materials and shipping only.	Each	$0.95	125	$118.75
Tree, Conifer, Seedling, Small	1512	Containerized conifer seedlings, 4 or 6 cubic inches; or bare root conifer seedlings 1+0 (one-year old seedlings grown in their original seedbed). Includes materials and shipping only.	Each	$0.94	63	$59.22
Tree shelter, solid tube type, 4 in. x 60 in.	1567	4 inch x 60 inch tree tube for protection from animal damage. Materials and shipping only.	Each	$6.67	188	$1,253.96
Cable ties, plastic	1575	Plastic cable ties (typ. 8-12 in.) to assist in securing items. Materials only.	Each	$0.07	376	$26.32
Stakes, wood, 3/4 in. x 3/4 in. x 60 in.	1583	3/4 in. x 3/4 in. x 60 in. wood stakes to fasten items in place. Includes materials only.	Each	$2.43	188	$456.84
Wire flags	1586	Small vinyl flags attached to wire stakes, typically, 36 in. length, for marking tree rows	Each	$0.13	100	$13.00

Practice: 380 - Windbreak/Shelterbelt Establishment and Renovation

Scenario: #130 - Trees, machine planted, weed barrier

Scenario Description:

Tree planting consisting of 2500 feet of trees for wind protection, energy conservation, wildlife habitat, air quality, snow management or to provide avisual screen. The planting may consist of shrubs, hardwood trees, conifers, or a combination. Trees and shrubs planted with a tree planting machine. Shrubs will be plantedwith a spacing of 4 to 6 feet and hardwoods/conifers 8 to 12 feet apart in the row with rows 16 feet apart. The scenario will include 1/4 shrubs, 1/2 hardwoods, and 1/4conifers based on feet of trees. Herbivores (deer, rabbits, etc.) are NOT expected to browse tree seedlings, tree protection is not needed. This practice is typically applied tocrop, pasture or range lands. Fabric installed to reduce competition from weeds and grass. Resource Concerns to be addressed include: Soil Erosion (wind);Excess/Insufficient Water (drifted snow, inefficient moisture management); Water Quality Degradation (excess nutrients in surface waters, pesticides transported to surfacewaters, excessive sediment in surface waters,); Degraded Plant Condition (undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food,cover/shelter, continuity); Livestock Production Limitation (inadequate shelter); Air Quality Impacts (emission of particulate matter, objectionable odors); Inefficient EnergyUse (facilities, farming/ranching practices and field operations).

Before Situation:

Agricultural field, livestock paddock, feedlot or farmstead needing protection from wind, additional wildlife food and cover, odor mitigation, visual screen ormanagement of snow deposition

After Situation:

Wind velocity suitably reduced to minimize soil erosion, energy loss or to manage snow deposition. Additional wildlife food and cover, mixing of odorplumes and visual screening.

Feature Measure: length of planted windbreak

Scenario Unit: Feet

Scenario Typical Size: 2,500.00

Scenario Total Cost: $2,707.31

Scenario Cost/Unit: $1.08

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	10	$253.60
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$36.34	9	$327.06
Mechanical tree planter	1600	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hours	$5.96	3	$17.88
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	30	$861.30
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	9	$273.24
Materials						
Mulch, polyethylene plastic, 1.0 mil	1303	1.0 mil polyethylene plastic mulch, with anchoring. Includes materials and shipping only.	Square Yard	$0.37	1670	$617.90
Shrub, Seedling, Small	1506	Bare root shrub seedling, 6 to 18 inches tall, includes containerized seedlings less than 10 cubic inches. Includes materials and shipping only.	Each	$1.06	156	$165.36
Tree, Hardwood, Seedling, Small	1509	Bare root hardwood seedlings 6 to 18 inches tall; includes tropical containerized seedlings of 8 cubic inches or smaller. Includes materials and shipping only.	Each	$0.95	125	$118.75
Tree, Conifer, Seedling, Small	1512	Containerized conifer seedlings, 4 or 6 cubic inches; or bare root conifer seedlings 1+0 (one-year old seedlings grown in their original seedbed). Includes materials and shipping only.	Each	$0.94	63	$59.22
Wire flags	1586	Small vinyl flags attached to wire stakes, typically, 36 in. length, for marking tree rows	Each	$0.13	100	$13.00

Practice: 380 - Windbreak/Shelterbelt Establishment and Renovation

Scenario: #131 - Trees, machine planted

Scenario Description:
Tree planting consisting of 2500 feet of trees for wind protection, energy conservation, wildlife habitat, air quality, snow management or to provide avisual screen. The planting may consist of shrubs, hardwood trees, conifers, or a combination. Trees and shrubs planted with a tree planting machine. Shrubs will be plantedwith a spacing of 4 to 6 feet and hardwoods/conifers 8 to 12 feet apart in the row with rows 16 feet apart. The scenario will include 1/4 shrubs, 1/2 hardwoods, and 1/4conifers based on feet of trees. Herbivores (deer, rabbits, etc.) are NOT expected to browse tree seedlings, tree protection is not needed. This practice is typically applied tocrop, pasture or range lands. Resource Concerns to be addressed include: Soil Erosion (wind); Excess/Insufficient Water (drifted snow, inefficient moisture management);Water Quality Degradation (excess nutrients in surface waters, pesticides transported to surface waters, excessive sediment in surface waters,); Degraded Plant Condition(undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food, cover/shelter, continuity); Livestock Production Limitation (inadequate shelter); AirQuality Impacts (emission of particulate matter, objectionable odors); Inefficient Energy Use (facilities, farming/ranching practices and field operations).

Before Situation:
Agricultural field, livestock paddock, feedlot or farmstead needing protection from wind, additional wildlife food and cover, odor mitigation, visual screen or management of snow deposition

After Situation:
Wind velocity suitably reduced to minimize soil erosion, energy loss or to manage snow deposition. Additional wildlife food and cover, mixing of odor plumes and visual screening.

Feature Measure: Number of trees

Scenario Unit: Each

Scenario Typical Size: 344.00

Scenario Total Cost: $962.85

Scenario Cost/Unit: $2.80

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	4	$101.44
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$36.34	3	$109.02
Mechanical tree planter	1600	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hours	$5.96	3	$17.88
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	10	$287.10
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	3	$91.08
Materials						
Shrub, Seedling, Small	1506	Bare root shrub seedling, 6 to 18 inches tall, includes containerized seedlings less than 10 cubic inches. Includes materials and shipping only.	Each	$1.06	156	$165.36
Tree, Hardwood, Seedling, Small	1509	Bare root hardwood seedlings 6 to 18 inches tall; includes tropical containerized seedlings of 8 cubic inches or smaller. Includes materials and shipping only.	Each	$0.95	125	$118.75
Tree, Conifer, Seedling, Small	1512	Containerized conifer seedlings, 4 or 6 cubic inches; or bare root conifer seedlings 1+0 (one-year old seedlings grown in their original seedbed). Includes materials and shipping only.	Each	$0.94	63	$59.22
Wire flags	1586	Small vinyl flags attached to wire stakes, typically, 36 in. length, for marking tree rows	Each	$0.13	100	$13.00

Practice: 380 - Windbreak/Shelterbelt Establishment and Renovation

Scenario: #132 - Trees, machine planted, wildlife protection, weed barrier

Scenario Description:
Tree planting consisting of 2500 feet of trees for wind protection, energy conservation, wildlife habitat, air quality, snow management or to provide a visual screen. The planting may consist of shrubs, hardwood trees, conifers, or a combination. Trees and shrubs planted with a tree planting machine. Shrubs will be planted with a spacing of 4 to 6 feet and hardwoods/conifers 8 to 12 feet apart in the row with rows 16 feet apart. The scenario will include 1/4 shrubs, 1/2 hardwoods, and 1/4 conifers based on feet of trees. Herbivore (deer, rabbits, etc.) damage is likely, so each tree must be protected with a rigid tube tree shelter. Fabric installed to reduce competition from weeds and grass. This practice is typically applied to crop, pasture or range lands. Resource Concerns to be addressed include: Soil Erosion (wind); Excess/Insufficient Water (drifted snow, inefficient moisture management); Water Quality Degradation (excess nutrients in surface waters, pesticides transported to surface waters, excessive sediment in surface waters,); Degraded Plant Condition (undesirable plant productivity and health); Inadequate habitat for Fish and Wildlife (food, cover/shelter, continuity); Livestock Production Limitation (inadequate shelter); Air Quality Impacts (emission of particulate matter, objectionable odors); Inefficient Energy Use (facilities, farming/ranching practices and field operations).

Before Situation:
Agricultural field, livestock paddock, feedlot or farmstead needing protection from wind, additional wildlife food and cover, odor mitigation, visual screen or management of snow deposition

After Situation:
Wind velocity suitably reduced to minimize soil erosion, energy loss or to manage snow deposition. Additional wildlife food and cover, mixing of odor plumes and visual screening.

Feature Measure: length of planted windbreak

Scenario Unit: Feet

Scenario Typical Size: 2,500.00

Scenario Total Cost: $4,570.37

Scenario Cost/Unit: $1.83

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	10	$253.60
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$36.34	9	$327.06
Mechanical tree planter	1600	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hours	$5.96	3	$17.88
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	34	$976.14
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	9	$273.24
Materials						
Mulch, polyethylene plastic, 1.0 mil	1303	1.0 mil polyethylene plastic mulch, with anchoring. Includes materials and shipping only.	Square Yard	$0.37	1700	$629.00
Shrub, Seedling, Small	1506	Bare root shrub seedling, 6 to 18 inches tall, includes containerized seedlings less than 10 cubic inches. Includes materials and shipping only.	Each	$1.06	156	$165.36
Tree, Hardwood, Seedling, Small	1509	Bare root hardwood seedlings 6 to 18 inches tall; includes tropical containerized seedlings of 8 cubic inches or smaller. Includes materials and shipping only.	Each	$0.95	125	$118.75
Tree, Conifer, Seedling, Small	1512	Containerized conifer seedlings, 4 or 6 cubic inches; or bare root conifer seedlings 1+0 (one-year old seedlings grown in their original seedbed). Includes materials and shipping only.	Each	$0.94	63	$59.22
Tree shelter, solid tube type, 4 in. x 60 in.	1567	4 inch x 60 inch tree tube for protection from animal damage. Materials and shipping only.	Each	$6.67	188	$1,253.96
Cable ties, plastic	1575	Plastic cable ties (typ. 8-12 in.) to assist in securing items. Materials only.	Each	$0.07	376	$26.32
Stakes, wood, 3/4 in. x 3/4 in. x 60 in.	1583	3/4 in. x 3/4 in. x 60 in. wood stakes to fasten items in place. Includes materials only.	Each	$2.43	188	$456.84
Wire flags	1586	Small vinyl flags attached to wire stakes, typically, 36 in. length, for marking tree rows	Each	$0.13	100	$13.00

Practice: 380 - Windbreak/Shelterbelt Establishment and Renovation

Scenario: #135 - 1 row windbreak - small acreage

Scenario Description:
One row of containerized shrubs planted to address resource concerns; Inefficient Energy Use, Air Quality Impacts and/or Fish and Wildlife Habitat. This practice is typically applied on cropland at field edges and around homesteads.

Before Situation:
Agricultural field or farmstead needing protections from wind, additional wildlife food and cover, odor mitigation, visual screening. The area generally includes arid or drought conditions that greatly reduce the success of tree survival.

After Situation:
A windbreak of containerized shrubs is installed by hand planting shrubs 6 ft apart. Wind velocity suitably diminished to reduce soil erosion or energy loss. Additional wildlife food and cover, mixing of odor plumes and visual screening. Greatly improved success rate of the windbreak due to the supplemental water during establishment.

Feature Measure: Length of windbreak row

Scenario Unit: Feet

Scenario Typical Size: 100.00

Scenario Total Cost: $436.15

Scenario Cost/Unit: $4.36

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$12.51	2	$25.02
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	3	$86.13
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	1	$48.60
Materials						
Shrub, Potted, Medium	1527	Potted shrub seedling, 2 gallons or larger. Includes materials and shipping only.	Each	$14.34	17	$243.78
Wire flags	1586	Small vinyl flags attached to wire stakes, typically, 36 in. length, for marking tree rows	Each	$0.13	17	$2.21
Fertilizer, tree, slow release, premix packet or spike	1594	Slow release fertilizer to gradually apply nutrients over time for tree establishment. 2.0 Oz Packet (Premixed: 16-16-16 or 16-8-8) or Fertilizer Spike	Each	$0.73	17	$12.41
Micro Irrigation, drip irrigation system, small scale	2170	An above ground, small scale, micro-irrigation system. Includes miniature emitters, tubes, or applicators placed along a water delivery line. Includes materials and shipping only.	Square Feet	$0.09	200	$18.00

Practice: 381 - Silvopasture

Scenario: #28 - Commercial thin pine plantation - establish native grasses

Scenario Description:
Commercial thinning of an existing stand of trees followed by establishment of native grasses.

Before Situation:
10-acre pine plantation that is overstocked, with a basal area of 100 sq. ft. per acre. There is very little available forage for livestock, due to the dense shade of the tree canopy. Resource Concerns include Degraded Plant Condition - Undesirable Plant Productivity and Health, Inadequate Structure and Composition, Wildfire Hazard, Excessive Biomass Accumulation; Livestock Production Limitation - Inadequate Feed and Forage, and Inadequate Livestock Shelter.

After Situation:
The stand is thinned commercially to a basal area of 50 sq. ft. per acre, which will allow adequate sunlight to the forest floor for grass production, yet still provide shade and some protection from the elements for livestock and wildlife. Since thinning is done commercially, no harvesting costs are incurred. Debris is removed, all tree cutting will leave the shortest possible stump height. The soil is prepared for planting using chemical and mechanical means, then a mix of native warm-season grasses will be established, providing forage to livestock and wildlife. All Resource Concerns listed above are addressed.

Feature Measure: Acres of silvopasture established

Scenario Unit: Acres

Scenario Typical Size: 10.00

Scenario Total Cost: $4,291.24

Scenario Cost/Unit: $429.12

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	10	$148.80
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	10	$67.30
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.61	10	$76.10
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$9.23	10	$92.30
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	2	$44.54
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$10.18	10	$101.80
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	8	$891.60
Materials						
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.81	500	$405.00
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	500	$340.00
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$26.18	20	$523.60
Tree Marking Paint	313	Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only.	Acres	$12.39	10	$123.90
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$12.66	10	$126.60
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$134.97	10	$1,349.70

Practice: 381 - Silvopasture

Scenario: #32 - Establish pine into established forage

Scenario Description:
Establishment of trees into an existing pasture that contains adequate native or introduced forage.

Before Situation:
10-acre pasture with suitable forage for livestock. There is very little protection from the elements (sun, wind, etc.) available to the livestock. Additionally, there are no long-term wood products being produced. Resource Concerns include Degraded Plant Condition - Undesirable Plant Productivity and Health, Inadequate Structure and Composition, Livestock Production Limitation - Inadequate Livestock Shelter.

After Situation:
The site will be prepared using Tree/Shrub Site Preparation (490), if needed, and then 200 pine trees per acre will be planted, providing shade and wind protection to livestock and wildlife, and, in time, producing a viable wood products crop. Per the conservation practice standard, livestock grazing will be deferred until the trees reach adequate height to resist damage, or use exclusion measures are established. All Resource Concerns listed above are adressed.

Feature Measure: Acres of silvopasture established

Scenario Unit: Acres

Scenario Typical Size: 10.00

Scenario Total Cost: $2,385.30

Scenario Cost/Unit: $238.53

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.61	10	$76.10
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$36.34	4	$145.36
Mechanical tree planter	1600	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hours	$5.96	4	$23.84
Materials						
Tree, Conifer, Seedling, Small	1512	Containerized conifer seedlings, 4 or 6 cubic inches; or bare root conifer seedlings 1+0 (one-year old seedlings grown in their original seedbed). Includes materials and shipping only.	Each	$0.94	2000	$1,880.00
Wire flags	1586	Small vinyl flags attached to wire stakes, typically, 36 in. length, for marking tree rows	Each	$0.13	2000	$260.00

Practice: 381 - Silvopasture

Scenario: #33 - Container Trees and Shrubs, 2 gallon and larger

Scenario Description:

Container trees and/or shrubs (potted) to be planted or interplanted into an existing pasture to establish woody plants in any area where they can be grown as part of an agroforestry application establishing a combination of trees or shrubs and compatible forages on the same acreage. Resource concerns addressed are degraded plant condition -- undesirable plant productivity and health, and inadequate structure and composition and degraded wildlife habitat. Payment includes container trees/shrubs and equipment and labor to plant. Foregone income is not included with this scenario. Site preparation is implemented through associated practice 490 Tree/Shrub Site Preparation. Additional associated practices may include: 315 Herbaceous Weed Control, 660 Tree/Shrub Pruning, 484 Mulching.

Before Situation:

A pasture with suitable forage for livestock is planned or exists. There is very little protection from the elements (sun, wind, etc.) available to the livestock. Additionally, there are no long-term wood products being produced.

After Situation:

The site will be prepared using Tree/Shrub Site Preparation (490), if needed, and then trees will be planted, providing shade and wind protection to livestock and wildlife, and, in time, producing a viable wood products crop. Scenario assumes trees are planted in a 30' x 30' spacing over 10 acres. Per the conservation practice standard, livestock grazing will be deferred until the trees reach adequate height to resist damage, or use exclusion measures until the trees are established. All Resource Concerns listed above are addressed.

Feature Measure: each treee/shrub

Scenario Unit: Each

Scenario Typical Size: 500.00

Scenario Total Cost: $9,357.24

Scenario Cost/Unit: $18.71

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$12.51	42	$525.42
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	42	$1,205.82
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	10	$486.00
Materials						
Tree, Hardwood, Potted, Medium	1532	Potted hardwood seedling, 2 gallons or larger. Includes materials and shipping only.	Each	$14.28	500	$7,140.00

Practice: 381 - Silvopasture

Scenario: #34 - Bareroot Trees and Shrubs, with Tree Shelters

Scenario Description:

Bare-root trees and/or shrubs to be planted or interplanted into an existing pasture to establish woody plants in any area where they can be grown as part of an agroforestry application establishing a combination of trees or shrubs and compatible forages on the same acreage. Resource concerns addressed are degraded plant condition -- undesirable plant productivity and health, and inadequate structure and composition and degraded wildlife habitat. Payment includes bare-root seedlings and equipment and labor to plant. Foregone income is not included with this scenario. Site preparation is implemented through associated practice 490 Tree/Shrub Site Preparation. Additional associated practices may include: 315 Herbaceous Weed Control, 660 Tree/Shrub Pruning, 484 Mulching.

Before Situation:

A pasture with suitable forage for livestock; however there is very little protection from the elements (sun, wind, etc.) available to the livestock. Additionally, there are no long-term wood products being produced.

After Situation:

The site will be prepared using Tree/Shrub Site Preparation (490), if needed, and then trees will be planted, providing shade and wind protection to livestock and wildlife, and, in time, producing a viable wood products crop. Scenario assumes trees are planted in a 30' x 30' spacing over 10 acres. Per the conservation practice standard, livestock grazing will be deferred until the trees reach adequate height to resist damage, or use exclusion measures until the trees are established. All Resource Concerns listed above are addressed.

Feature Measure: each tree/shrub established

Scenario Unit: Each

Scenario Typical Size: 484.00

Scenario Total Cost: $5,318.96

Scenario Cost/Unit: $10.99

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$12.51	17	$212.67
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	59	$1,693.89
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	1	$48.60
Materials						
Tree, Hardwood, Seedling, Medium	1510	Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only.	Each	$1.74	484	$842.16
Tree shelter, solid tube type, 4 in. x 36 in	1565	4 inch x 36 inch tree tube for protection from animal damage. Materials and shipping only.	Each	$3.90	484	$1,887.60
Cable ties, plastic	1575	Plastic cable ties (typ. 8-12 in.) to assist in securing items. Materials only.	Each	$0.07	968	$67.76
Stakes, wood, 3/4 in. x 3/4 in. x 36 in.	1581	3/4 in. x 3/4 in. x 36 in. wood stakes to fasten items in place. Includes materials only.	Each	$1.17	484	$566.28

Practice: 381 - Silvopasture

Scenario: #35 - Bareroot Trees and Shrubs

Scenario Description:

Bare-root trees and/or shrubs to be planted or interplanted into an existing pasture to establish woody plants in any area where they can be grown as part of an agroforestry application establishing a combination of trees or shrubs and compatible forages on the same acreage. Resource concerns addressed are degraded plant condition -- undesirable plant productivity and health, and inadequate structure and composition and degraded wildlife habitat. Payment includes bare-root seedlings and equipment and labor to plant. Foregone income is not included with this scenario. Site preparation is implemented through associated practice 490 Tree/Shrub Site Preparation. Additional associated practices may include: 315 Herbaceous Weed Control, 660 Tree/Shrub Pruning, 484 Mulching.

Before Situation:

A pasture with suitable forage for livestock; however there is very little protection from the elements (sun, wind, etc.) available to the livestock. Additionally, there are no long-term wood products being produced.

After Situation:

The site will be prepared using Tree/Shrub Site Preparation (490), if needed, and then trees will be planted, providing shade and wind protection to livestock and wildlife, and, in time, producing a viable wood products crop. Scenario assumes trees are planted in a 30' x 30' spacing over 10 acres. Per the conservation practice standard, livestock grazing will be deferred until the trees reach adequate height to resist damage, or use exclusion measures until the trees are established. All Resource Concerns listed above are addressed.

Feature Measure: Per Tree/Shrub planted

Scenario Unit: Each

Scenario Typical Size: 500.00

Scenario Total Cost: $1,619.34

Scenario Cost/Unit: $3.24

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$12.51	17	$212.67
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	17	$488.07
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	1	$48.60
Materials						
Tree, Hardwood, Seedling, Medium	1510	Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only.	Each	$1.74	500	$870.00

Practice: 381 - Silvopasture

Scenario: #36 - Container Trees and Shrubs, 2 gallon and larger with Tree Shelters

Scenario Description:

Container trees and/or shrubs (potted) to be planted or interplanted into an existing pasture to establish woody plants in any area where they can be grown as part of an agroforestry application establishing a combination of trees or shrubs and compatible forages on the same acreage. Resource concerns addressed are degraded plant condition -- undesirable plant productivity and health, and inadequate structure and composition and degraded wildlife habitat. Payment includes container trees/shrubs, tree shelters, and equipment and labor to plant. Foregone income is not included with this scenario. Site preparation is implemented through associated practice 490 Tree/Shrub Site Preparation. Additional associated practices may include: 315 Herbaceous Weed Control, 660 Tree/Shrub Pruning, 484 Mulching.

Before Situation:

A pasture with suitable forage for livestock is planned or exists. There is very little protection from the elements (sun, wind, etc.) available to the livestock. Additionally, there are no long-term wood products being produced.

After Situation:

The site will be prepared using Tree/Shrub Site Preparation (490), if needed, and then trees will be planted, providing shade and wind protection to livestock and wildlife, and, in time, producing a viable wood products crop. Scenario assumes trees are planted in a 30' x 30' spacing over 10 acres. Per the conservation practice standard, livestock grazing will be deferred until the trees reach adequate height to resist damage, or use exclusion measures until the trees are established. All Resource Concerns listed above are addressed.

Feature Measure: each tree/shrub

Scenario Unit: Each

Scenario Typical Size: 500.00

Scenario Total Cost: $14,493.06

Scenario Cost/Unit: $28.99

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$12.51	42	$525.42
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	84	$2,411.64
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	10	$486.00
Materials						
Tree, Hardwood, Potted, Medium	1532	Potted hardwood seedling, 2 gallons or larger. Includes materials and shipping only.	Each	$14.28	500	$7,140.00
Tree shelter, solid tube type, 5 in. x 48 in.	1571	5 inch x 48 inch tree tube for protection from animal damage. Materials and shipping only.	Each	$5.29	500	$2,645.00
Cable ties, plastic	1575	Plastic cable ties (typ. 8-12 in.) to assist in securing items. Materials only.	Each	$0.07	1000	$70.00
Stakes, wood, 3/4 in. x 3/4 in. x 60 in.	1583	3/4 in. x 3/4 in. x 60 in. wood stakes to fasten items in place. Includes materials only.	Each	$2.43	500	$1,215.00

Practice: 381 - Silvopasture

Scenario: #37 - Container Trees and Shrubs, less than 2 gallon with tree shelters

Scenario Description:

Container trees and/or shrubs (potted) to be planted or interplanted into an existing pasture to establish woody plants in any area where they can be grown as part of an agroforestry application establishing a combination of trees or shrubs and compatible forages on the same acreage. Resource concerns addressed are degraded plant condition -- undesirable plant productivity and health, and inadequate structure and composition and degraded wildlife habitat. Payment includes container trees/shrubs, tree shelters, and equipment and labor to plant. Foregone income is not included with this scenario. Site preparation is implemented through associatedpractice 490 Tree/Shrub Site Preparation. Additional associated practices may include: 315 Herbaceous Weed Control, 660 Tree/Shrub Pruning, 484 Mulching.

Before Situation:

A pasture with suitable forage for livestock is planned or exists. There is very little protection from the elements (sun, wind, etc.) available to the livestock. Additionally, there are no long-term wood products being produced.

After Situation:

The site will be prepared using Tree/Shrub Site Preparation (490), if needed, and then trees will be planted, providing shade and wind protection to livestock and wildlife, and, in time, producing a viable wood products crop. Scenario assumes trees are planted in a 30' x 30' spacing over 10 acres. Per the conservation practice standard, livestock grazing will be deferred until the trees reach adequate height to resist damage, or use exclusion measures until the trees are established. All Resource Concerns listed above are addressed.

Feature Measure: each tree/shrub

Scenario Unit: Each

Scenario Typical Size: 500.00

Scenario Total Cost: $9,808.06

Scenario Cost/Unit: $19.62

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$12.51	42	$525.42
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	84	$2,411.64
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	10	$486.00
Materials						
Tree, Hardwood, Potted, Small	1529	Potted hardwood seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$4.91	500	$2,455.00
Tree shelter, solid tube type, 5 in. x 48 in.	1571	5 inch x 48 inch tree tube for protection from animal damage. Materials and shipping only.	Each	$5.29	500	$2,645.00
Cable ties, plastic	1575	Plastic cable ties (typ. 8-12 in.) to assist in securing items. Materials only.	Each	$0.07	1000	$70.00
Stakes, wood, 3/4 in. x 3/4 in. x 60 in.	1583	3/4 in. x 3/4 in. x 60 in. wood stakes to fasten items in place. Includes materials only.	Each	$2.43	500	$1,215.00

Practice: 381 - Silvopasture

Scenario: #38 - Container Trees and Shrubs, less than 2 gallon

Scenario Description:

'Container trees and/or shrubs (potted) to be planted or interplanted into an existing pasture to establish woody plants in any area where they can be grown as part of an agroforestry application establishing a combination of trees or shrubs and compatible forages on the same acreage. Resource concerns addressed are degraded plant condition -- undesirable plant productivity and health, and inadequate structure and composition and degraded wildlife habitat. Payment includes container trees/shrubs and equipment and labor to plant. Foregone income is not included with this scenario. Site preparation is implemented through associated practice 490Tree/Shrub Site Preparation. Additional associated practices may include: 315 Herbaceous Weed Control, 660 Tree/Shrub Pruning, 484 Mulching.'

Before Situation:

A pasture with suitable forage for livestock is planned or exists. There is very little protection from the elements (sun, wind, etc.) available to the livestock. Additionally, there are no long-term wood products being produced.

After Situation:

The site will be prepared using Tree/Shrub Site Preparation (490), if needed, and then trees will be planted, providing shade and wind protection to livestock and wildlife, and, in time, producing a viable wood products crop. Scenario assumes trees are planted in a 30' x 30' spacing over 10 acres. Per the conservation practice standard, livestock grazing will be deferred until the trees reach adequate height to resist damage, or use exclusion measures until the trees are established. All Resource Concerns listed above are addressed.

Feature Measure: each tree/shrub

Scenario Unit: Each

Scenario Typical Size: 500.00

Scenario Total Cost: $4,672.24

Scenario Cost/Unit: $9.34

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$12.51	42	$525.42
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	42	$1,205.82
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	10	$486.00
Materials						
Tree, Hardwood, Potted, Small	1529	Potted hardwood seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$4.91	500	$2,455.00

Practice: 381 - Silvopasture

Scenario: #39 - Bareroot Trees and Shrubs with Tree Protection

Scenario Description:

Bare-root trees and/or shrubs to be planted or interplanted into an existing pasture to establish woody plants in any area where they can be grown as part of an agroforestry application establishing a combination of trees or shrubs and compatible forages on the same acreage. Resource concerns addressed are degraded plant condition -- undesirable plant productivity and health, and inadequate structure and composition and degraded wildlife habitat. Payment includes bare-root seedlings and equipment and labor to plant plus the installation of wire cage tree shelters around each tree for protection from grazing animals. This is a standard forestry technique to improve tree/shrub survival during the establishment phase. Shelters will be monitored by the client, repaired as needed, and removed when trees are sufficiently established. Foregone income is not included with this scenario. Site preparation is implemented through associated practice 490 Tree/Shrub Site Preparation. Additional associated practices may include: 315 Herbaceous Weed Control, 660 Tree/Shrub Pruning, 484 Mulching. Resource concerns addressed are Degraded Plant Condition - Undesirable plant productivity and health, Inadequate structure and composition;Soil Erosion - Wind erosion, Sheet and rill erosion, Ephemeral gully erosion, and Classic gully erosion; Fish and Wildlife - Inadequate Habitat - Cover/Shelter, and Food; and Water Quality - Excessive sediment in surface waters.

Before Situation:

A pasture with suitable forage for livestock is planned or exists. There is very little protection from the elements (sun, wind, etc.) available to the livestock. Additionally, there are no long-term wood products being produced.

After Situation:

Trees have been planted on the site, providing shade, wind, and snow protection to livestock and wildlife, and benefitting soil, water, and carbon sequestration. Scenario assumes trees are planted in a 30' x 30' spacing over 10 acres and each tree is protected with a wire cage tree shelter covering a 4 ft diameter area around the tree, to be removed when trees are established. All Resource Concerns listed above are addressed.

Feature Measure: Per Tree/Shrub Planted

Scenario Unit: Each

Scenario Typical Size: 500.00

Scenario Total Cost: $22,511.07

Scenario Cost/Unit: $45.02

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$12.51	17	$212.67
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	100	$2,871.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	1	$48.60
Materials						
Wire, Woven, Galvanized, 12.5 Gauge, 48 inch	4	Galvanized 12.5 gauge, 48 in. - 330' roll. Includes materials and shipping only.	Each	$334.44	20	$6,688.80
Post, Steel T, 1.33 lbs, 6 ft.	15	Steel Post, Studded 6 ft. - 1.33 lb. Includes materials and shipping only.	Each	$7.23	1500	$10,845.00
Fence, Wire Assembly, Woven Wire	35	Brace pins, twist sticks, staples. Includes materials and shipping only.	Feet	$0.15	6500	$975.00
Tree, Hardwood, Seedling, Medium	1510	Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only.	Each	$1.74	500	$870.00

Practice: 381 - Silvopasture

Scenario: #40 - Container Trees and Shrubs, less than 2 gallon with Tree Protection

Scenario Description:

Container trees and/or shrubs (potted) to be planted or interplanted into an existing pasture to establish woody plants in any area where they can be grown as part of an agroforestry application establishing a combination of trees or shrubs and compatible forages on the same acreage. Payment includes container trees/shrubs and equipment and labor to plant plus the installation of wire cage tree shelters around each tree for protection from grazing animals. This is a standard forestry technique to improve tree/shrub survival during the establishment phase. Shelters will be monitored by the client, repaired as needed, and removed when trees are sufficiently established. Foregone income is not included with this scenario. Site preparation is implemented through associated practice 490 Tree/Shrub Site Preparation. Additional associated practices may include: 315 Herbaceous Weed Control, 660 Tree/Shrub Pruning, 484 Mulching. Resource concerns addressed are Degraded Plant Condition - Undesirable plant productivity and health, Inadequate structure and composition; Soil Erosion - Wind erosion, Sheet and rill erosion, Ephemeral gully erosion, and Classic gully erosion; Fish and Wildlife - Inadequate Habitat - Cover/Shelter, and Food; and, Water Quality - Excessive sediment in surface waters.

Before Situation:

A pasture with suitable forage for livestock is planned or exists. There is very little protection from the elements (sun, wind, etc.) available to the livestock. Additionally, there are no long-term wood products being produced.

After Situation:

Trees have been planted on the site, providing shade, wind, and snow protection to livestock and wildlife, and benefitting soil, water, and carbon sequestration. Scenario assumes trees are planted in a 30' x 30' spacing over 10 acres and each tree is protected with a wire cage tree shelter covering a 4 ft diameter area around the tree, to be removed when trees are established. All Resource Concerns listed above are addressed..

Feature Measure: Per Tree/Shrub Planted

Scenario Unit: Each

Scenario Typical Size: 500.00

Scenario Total Cost: $25,563.97

Scenario Cost/Unit: $51.13

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$12.51	42	$525.42
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	125	$3,588.75
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	10	$486.00
Materials						
Wire, Woven, Galvanized, 12.5 Gauge, 48 inch	4	Galvanized 12.5 gauge, 48 in. - 330' roll. Includes materials and shipping only.	Each	$334.44	20	$6,688.80
Post, Steel T, 1.33 lbs, 6 ft.	15	Steel Post, Studded 6 ft. - 1.33 lb. Includes materials and shipping only.	Each	$7.23	1500	$10,845.00
Fence, Wire Assembly, Woven Wire	35	Brace pins, twist sticks, staples. Includes materials and shipping only.	Feet	$0.15	6500	$975.00
Tree, Hardwood, Potted, Small	1529	Potted hardwood seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$4.91	500	$2,455.00

Practice: 381 - Silvopasture

Scenario: #41 - Container Trees and Shrubs, 2 gallon and larger with Tree Protection

Scenario Description:

Container trees and/or shrubs (potted) to be planted or interplanted into an existing pasture to establish woody plants in any area where they can be grown as part of an agroforestry application establishing a combination of trees or shrubs and compatible forages on the same acreage. Payment includes container seedlings and equipment and labor to plant plus the installation of wire cage tree shelters around each tree for protection from grazing animals. This is a standard forestry technique to improve tree/shrub survival during the establishment phase. Shelters will be monitored by the client, repaired as needed, and removed when trees are sufficiently established. Foregone income is not included with this scenario. Site preparation is implemented through associated practice 490 Tree/Shrub Site Preparation. Additional associated practices may include: 315 Herbaceous Weed Control, 660 Tree/Shrub Pruning, 484 Mulching. Resource concerns addressed are Degraded Plant Condition - Undesirable plant productivity and health, Inadequate structure and composition; Soil Erosion - Wind erosion, Sheet and rill erosion, Ephemeral gully erosion, and Classic gully erosion; Fish and Wildlife - Inadequate Habitat - Cover/Shelter, and Food; and, Water Quality - Excessive sediment in surface waters.

Before Situation:

A pasture with suitable forage for livestock is planned or exists. There is very little protection from the elements (sun, wind, etc.) available to the livestock. Additionally, there are no long-term wood products being produced.

After Situation:

Trees have been planted on the site, providing shade, wind, and snow protection to livestock and wildlife, and benefitting soil, water, and carbon sequestration. Scenario assumes trees are planted in a 30' x 30' spacing over 10 acres and each tree is protected with a wire cage tree shelter covering a 4 ft diameter area around the tree, to be removed when trees are established. All Resource Concerns listed above are addressed.

Feature Measure: Per Tree/Shrub Planted

Scenario Unit: Each

Scenario Typical Size: 500.00

Scenario Total Cost: $30,248.97

Scenario Cost/Unit: $60.50

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$12.51	42	$525.42
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	125	$3,588.75
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	10	$486.00
Materials						
Wire, Woven, Galvanized, 12.5 Gauge, 48 inch	4	Galvanized 12.5 gauge, 48 in. - 330' roll. Includes materials and shipping only.	Each	$334.44	20	$6,688.80
Post, Steel T, 1.33 lbs, 6 ft.	15	Steel Post, Studded 6 ft. - 1.33 lb. Includes materials and shipping only.	Each	$7.23	1500	$10,845.00
Fence, Wire Assembly, Woven Wire	35	Brace pins, twist sticks, staples. Includes materials and shipping only.	Feet	$0.15	6500	$975.00
Tree, Hardwood, Potted, Medium	1532	Potted hardwood seedling, 2 gallons or larger. Includes materials and shipping only.	Each	$14.28	500	$7,140.00

Practice: 381 - Silvopasture

Scenario: #42 - Bareroot Conifer Establishment

Scenario Description:
Establishment of trees into an existing pasture that contains adequate native or introduced forage.

Before Situation:
10-acre pasture with suitable forage for livestock. There is very little protection from the elements (sun, wind, etc.) available to the livestock. Additionally, there are no long-term wood products being produced. Resource Concerns include Degraded Plant Condition - Undesirable Plant Productivity and Health, Inadequate Structure and Composition, Livestock Production Limitation - Inadequate Livestock Shelter.

After Situation:
The site will be prepared using Tree/Shrub Site Preparation (490), if needed, and then 200 pine trees per acre will be planted, providing shade and wind protection to livestock and wildlife, and, in time, producing a viable wood products crop. Per the conservation practice standard, livestock grazing will be deferred until the trees reach adequate height to resist damage, or use exclusion measures are established. All Resource Concerns listed above are addressed.

Feature Measure: Acres of silvopasture established

Scenario Unit: Acres

Scenario Typical Size: 10.00

Scenario Total Cost: $2,429.24

Scenario Cost/Unit: $242.92

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.61	10	$76.10
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$36.34	4	$145.36
Mechanical tree planter	1600	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hours	$5.96	4	$23.84
Materials						
Tree, Conifer, Seedling, Small	1512	Containerized conifer seedlings, 4 or 6 cubic inches; or bare root conifer seedlings 1+0 (one-year old seedlings grown in their original seedbed). Includes materials and shipping only.	Each	$0.94	2000	$1,880.00
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 382 - Fence

Scenario: #2 - Multi Strand Barbed or smooth Wire Difficult terrain (LSR)

Scenario Description:

Barbed, Smooth ,or Woven Wire Difficult Installation - Installation of fence in difficult situations will allow for implementation of grazing management that allows for an adequate rest and recovery period, protection of sensitive area, improved water quality, reduction of noxious and invasive weeds. Constructed using fencing materials rather than a pre-manufactured gate.

Before Situation:

On grazing lands health and vigor are negatively impacted by poor grazing distribution, timing of grazing and inadequate rest and recovery periods. Water quality is impacted by increased erosion and runoff, cattle access to water bodies is uncontrolled. Reduced vegetative cover increases the opportunity for encroachment of noxious and invasive weeds. Fence installation conditions are for difficult sites such as poor access, steep slopes, rocky sites, dense brush, wet conditions etc.

After Situation:

Installation of fence will allow for implementation of grazing management that allows for an adequate rest and recovery period, protection of sensitive area, improved water quality, reduction of noxious and invasive weeds. Fence includes posts, wire, fasteners, gates, brace posts, etc... Fence will be installed with wildlife friendly considerations.

Feature Measure: Length of Fence

Scenario Unit: Feet

Scenario Typical Size: 1,320.00

Scenario Total Cost: $5,066.33

Scenario Cost/Unit: $3.84

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hours	$9.89	10	$98.90
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	1	$6.30
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	5	$126.80
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$36.34	10	$363.40
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	60	$1,722.60
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	10	$303.60
Materials						
Wire, Barbed, Galvanized, 12.5 Gauge, 1,320' roll	1	Galvanized 12.5 gauge, 1,320' roll. Includes materials and shipping only.	Each	$125.50	4	$502.00
Post, Wood, CCA treated, 3-4 in. x 7 ft.	9	Wood Post, Line 3-4 inch dia. X 7 ft., CCA Treated. Includes materials and shipping only.	Each	$11.38	20	$227.60
Post, Wood, CCA treated, 6 in. x 8 ft.	12	Wood Post, End 6 inch dia. X 8 ft., CCA Treated. Includes materials and shipping only.	Each	$25.26	8	$202.08
Post, Steel T, 1.33 lbs, 6 ft.	15	Steel Post, Studded 6 ft. - 1.33 lb. Includes materials and shipping only.	Each	$7.23	90	$650.70
Fence, Wire Assembly, Barbed Wire	30	Brace pins, battens, clips, staples. Includes materials and shipping only.	Feet	$0.20	1320	$264.00
Vinyl Undersill Strips	241	Marking material using the undersill strips of vinyl siding. Priced per foot of fence per each wire. Materials only.	Feet	$0.11	500	$55.00
Gate, Pipe, 12 ft.	1057	6 rail tube gate, 16 gauge. Includes materials and shipping only.	Each	$239.41	1	$239.41
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 382 - Fence

Scenario: #4 - Electric, High Tensile

Scenario Description:
Electric - Installation of fence will allow for implementation of a grazing management that allows for an adequate rest and recovery period, protection of sensitive area, improved water quality, reduction of noxious and invasive weeds.

Before Situation:
On grazinglands health and vigor are negatively impacted by poor grazing distribution, timing of grazing and inadequate rest and recovery periods. Water quality is impacted by increased erosion and runoff, cattle access to water bodies is uncontrolled. Reduced vegetative cover increases the opportunity for encroachment of noxious and invasive weeds.

After Situation:
Installation of fence will allow for implementation of grazing management that allows for an adequate rest and recovery period, protection of sensitive area, improved water quality, reduction of noxious and invasive weeds. Fence includes posts, wire, fasteners, gates, fence charger, etc... Two to three strand wire is commonly installed. Fence will be installed with wildlife friendly considerations.

Feature Measure: Length of Fence

Scenario Unit: Feet

Scenario Typical Size: 1,320.00

Scenario Total Cost: $3,274.41

Scenario Cost/Unit: $2.48

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hours	$9.89	3	$29.67
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	2	$50.72
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$36.34	3	$109.02
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	20	$574.20
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	3	$91.08
Materials						
Wire, High Tensile, 12.5 Gauge, 4,000' roll	2	High Tensile 12.5 gauge, 4,000' roll. Includes materials and shipping only.	Each	$158.31	0.66	$104.48
Post, Wood, CCA treated, 3-4 in. x 7 ft.	9	Wood Post, Line 3-4 inch dia. X 7 ft., CCA Treated. Includes materials and shipping only.	Each	$11.38	2	$22.76
Post, Wood, CCA treated, 6 in. x 8 ft.	12	Wood Post, End 6 inch dia. X 8 ft., CCA Treated. Includes materials and shipping only.	Each	$25.26	8	$202.08
Post, Fiberglass, 7/8 in X 6 ft	18	Fiberglass line post, 7/8 inch diameter X 6 foot length. Includes materials and shipping only.	Each	$13.56	60	$813.60
Electric, Ground Rods	20	Electric, Ground Rod for electric fence. Includes materials and shipping only.	Each	$17.70	6	$106.20
Electric, Ground Rod Clamps	21	Electric, Ground Rod Clamps for electric fence. Includes materials and shipping only.	Each	$2.53	6	$15.18
Electric, Lightening Diverter	22	Electric, Lightening diverter for electric fence. Includes materials and shipping only.	Each	$10.27	1	$10.27
Electric, Insulated cable	23	Electric, Insulated cable for electric fence. Typically in spools of 100 to 200 feet. Includes materials and shipping only.	Each	$41.90	1	$41.90
Electric, Tester	26	Electric, Tester for electric fence. Includes materials and shipping only.	Each	$46.17	1	$46.17
Electric, Energizer, 6 joule	29	Electric, Energizer, 6 joule for electric fence. Includes materials and shipping only.	Each	$427.97	1	$427.97
Fence, Wire Assembly, High Tensile, Electric, 2 Strand	33	Brace pins, springs, strainers, battens, clips, crimp sleeves, staples, insulators, wrap around sleeves. Includes materials and shipping only.	Feet	$0.08	1320	$105.60
Gate, Pipe, 10 ft.	1056	6 rail tube gate, 16 gauge. Includes materials and shipping only.	Each	$219.57	1	$219.57
Mobilization						

Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 382 - Fence

Scenario: #5 - Feed or Feeding Area Enclosure

Scenario Description:
Installation of fence reduces resource concerns associated with livestock feeding operations and/or wildlife access to prevent conflicts between humans and livestock or wildlife species.

Before Situation:
Wildlife negatively impacting sensitive areas such as riparian areas, windbreaks and shelterbelts or feed storage. Disease transmission from wildlife posses a significant health risk to domestic animals.

After Situation:
Installation of fence reduces resource concerns associated with livestock and/or wildlife access and prevents conflicts between humans and threatened, endangered or sensitive species. Fence includes posts, wire, fasteners, gates, etc...

Feature Measure: Length of Fence

Scenario Unit: Feet

Scenario Typical Size: 1,320.00

Scenario Total Cost: $8,225.28

Scenario Cost/Unit: $6.23

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hours	$9.89	5	$49.45
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	4	$101.44
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$36.34	5	$181.70
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	60	$1,722.60
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	5	$151.80
Materials						
Wire, Woven, Wildlife, 96 in.	6	High Tensile 12.5 gauge, 96 inch - 330 foot roll. Includes materials and shipping only.	Each	$711.97	4	$2,847.88
Post, Wood, CCA treated, 6 in. x 8 ft.	12	Wood Post, End 6 inch dia. X 8 ft., CCA Treated. Includes materials and shipping only.	Each	$25.26	8	$202.08
Post, Wood, CCA treated, 6 in. x 12-14 ft.	13	Wood Post, Line/End 6 inch dia. X 12-14 ft., CCA Treated. Includes materials and shipping only.	Each	$38.98	20	$779.60
Post, Steel T, 1.33 lbs, 10 ft.	17	Steel Post, Studded 10 ft. - 1.33 lb. Includes materials and shipping only.	Each	$12.88	90	$1,159.20
Gate, Game, 8 ft. High X 16 ft. Wide	1086	16 ft. Wide Game Gate (8 ft. tall). Includes materials and shipping only.	Each	$725.59	1	$725.59
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 382 - Fence

Scenario: #6 - Safety

Scenario Description:

A barrier (fence) implemented on an NRCS constructed waste storage system according to engineering design to exclude human access. Permanently installed fence built to (1) keep humans away from waste ponds & lagoons, or (2) to protect sensitive areas (riparian areas, wetlands, springs, etc.) from heavy livestock pressure. Heavy grade fence materials and close post spacing required. This is a facilitating practice to access control because fence is not 'bundled' into the access control practice scenarios.

Before Situation:

Where a NRCS designed and constructed waste storage pond is planned whereby significant risk to human safety is determined to be evident. Livestock has access to sensitive areas that may cause detrimental effect to animal/human health and wilidlife habitat. Resouce concerns affected are plant health and vigor, wildlife habitat, compaction of soils, runoff of sediment or water quality due to turbidity..

After Situation:

Humans and livestock are excluded from the waste storage pond for safety purposes by installing a fence around a waste holding pond. The fence would typically be 100 wide x 175 long with one gate and installed by a fencing contractor. Woven wire fence with one strand of barb wire on top with a gate. Improved livestock control and access to water or other sensative areas will promote saftey for livestock/humans improve health, vigor of sensitive species, limiting soil erosion, and condition.

Feature Measure: length of fence

Scenario Unit: Feet

Scenario Typical Size: 450.00

Scenario Total Cost: $2,580.94

Scenario Cost/Unit: $5.74

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hours	$9.89	6	$59.34
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	6	$152.16
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$36.34	6	$218.04
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	12	$344.52
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	6	$182.16
Materials						
Wire, Barbed, Galvanized, 12.5 Gauge, 1,320' roll	1	Galvanized 12.5 gauge, 1,320' roll. Includes materials and shipping only.	Each	$125.50	1	$125.50
Wire, Woven, Galvanized, 12.5 Gauge, 32 in	3	Galvanized 12.5 gauge, 32 inch - 330 foot roll. Includes materials and shipping only.	Each	$199.03	1	$199.03
Post, Wood, CCA treated, 3-4 in. x 7 ft.	9	Wood Post, Line 3-4 inch dia. X 7 ft., CCA Treated. Includes materials and shipping only.	Each	$11.38	8	$91.04
Post, Wood, CCA treated, 6 in. x 8 ft.	12	Wood Post, End 6 inch dia. X 8 ft., CCA Treated. Includes materials and shipping only.	Each	$25.26	4	$101.04
Post, Steel T, 1.33 lbs, 6 ft.	15	Steel Post, Studded 6 ft. - 1.33 lb. Includes materials and shipping only.	Each	$7.23	45	$325.35
Gate, Pipe, 12 ft.	1057	6 rail tube gate, 16 gauge. Includes materials and shipping only.	Each	$239.41	2	$478.82
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 382 - Fence

Scenario: #7 - Chain link

Scenario Description:
A chainlink barrier (fence) implemented on an NRCS constructed aquaculture ponds, according to engineering design, to exclude human access and exclude predators. Fence is to be used instead of bundling the fence costs into the payment for Aquacultural Pond.

Before Situation:
Where an NRCS designed and constructed aquaculture pond is planned.

After Situation:
Humans and wildlife are excluded from the aquaculture pond by installing the fence. The typical size is 350 feet in length by 150 feet in width, with one gate. It is usually installed by a fencing contractor. Improved human and wildlife control will promote saftey for humans, protect the pond liner from puncture, and reduce predation.

Feature Measure: length of fence

Scenario Unit: Feet

Scenario Typical Size: 1,000.00

Scenario Total Cost: $24,536.94

Scenario Cost/Unit: $24.54

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Materials						
Wire, Barbed, Galvanized, 12.5 Gauge, 1,320' roll	1	Galvanized 12.5 gauge, 1,320' roll. Includes materials and shipping only.	Each	$125.50	1	$125.50
Fence, Chain Link	1079	Fence, Chain Link, 5 foot High, 9 ga Wire, Posts in Concrete on 10 foot Centers. Includes all materials, equipment and labor.	Feet	$21.16	1000	$21,160.00
Gate, Chain Link, Slide Gate, Per LF	1081	Chain Link Gate, 5 feet tall, per linear foot. Installed in Concrete.	Feet	$188.86	16	$3,021.76

Practice: 382 - Fence

Scenario: #8 - Pasture Paddock

Scenario Description:
Electric - single strand for Wallace Center Pasture project and other demonstration projects. Single polywire or other movable fence to adjust paddock sizes during grazing season to fit plant growth and stocking rates

Before Situation:
On grazinglands health and vigor are negatively impacted by poor grazing distribution, timing of grazing and inadequate rest and recovery periods. Water quality is impacted by increased erosion and runoff, cattle access to water bodies is uncontrolled. Reduced vegetative cover increases the opportunity for encroachment of noxious and invasive weeds.

After Situation:
Installation of fence will allow for implementation of grazing management that allows for an adequate rest and recovery period, protection of sensitive area, improved water quality, reduction of noxious and invasive weeds. Fence includes posts, wire, fasteners, gates, fence charger, etc... Two to three strand wire is commonly installed. Fence will be installed with wildlife friendly considerations.

Feature Measure: Length of Fence

Scenario Unit: Feet

Scenario Typical Size: 1,310.00

Scenario Total Cost: $771.77

Scenario Cost/Unit: $0.59

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	2	$57.42
Materials						
Wire, Polytape	7	Wire, Polytape for electric fence. Rolls of 655' to 825'. Includes materials and shipping only.	Each	$66.77	2	$133.54
Post, Fiberglass, 7/8 in X 6 ft	18	Fiberglass line post, 7/8 inch diameter X 6 foot length. Includes materials and shipping only.	Each	$13.56	26	$352.56
Electric, Tester	26	Electric, Tester for electric fence. Includes materials and shipping only.	Each	$46.17	1	$46.17
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08

Practice: 382 - Fence

Scenario: #9 - High Tensile Electric One Strand

Scenario Description:

Electric - Installation of fence will allow for implementation of a grazing management that allows for an adequate rest and recovery period, protection of sensitive area, improved water quality, reduction of noxious and invasive weeds. Single wire fence is primarily used for interior subdivision fences in grazing systems for beef and dairy cattle. This will be part of a fencing system that includes multistrand high tensile electric perimeter fences.

Before Situation:

On grazinglands health and vigor are negatively impacted by poor grazing distribution, timing of grazing and inadequate rest and recovery periods. Water quality is impacted by increased erosion and runoff, cattle access to water bodies is uncontrolled. Reduced vegetative cover increases the opportunity for encroachment of noxious and invasive weeds.

After Situation:

Installation of fence will allow for implementation of grazing management that allows for an adequate rest and recovery period, protection of sensitive area, improved water quality, reduction of noxious and invasive weeds. Fence includes posts, wire, fasteners, gates, fence charger, etc... One strand wire is installed. Fence will be installed with wildlife friendly considerations.

Feature Measure: Length of Fence

Scenario Unit: Feet

Scenario Typical Size: 1,320.00

Scenario Total Cost: $1,530.64

Scenario Cost/Unit: $1.16

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hours	$9.89	1	$9.89
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	2	$50.72
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$36.34	2	$72.68
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	15	$430.65
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	2	$60.72
Materials						
Post, Wood, CCA treated, 6 in. x 8 ft.	12	Wood Post, End 6 inch dia. X 8 ft., CCA Treated. Includes materials and shipping only.	Each	$25.26	4	$101.04
Post, Fiberglass, 7/8 in X 6 ft	18	Fiberglass line post, 7/8 inch diameter X 6 foot length. Includes materials and shipping only.	Each	$13.56	35	$474.60
Fence, Wire Assembly, High Tensile, Electric, 1 Strand	32	Brace pins, springs, strainers, battens, clips, crimp sleeves, staples, insulators, wrap around sleeves. Includes materials and shipping only.	Feet	$0.02	1320	$26.40
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 382 - Fence

Scenario: #61 - Barnyard Wood Post Fencing

Scenario Description:

A barrier (fence) implemented on an NRCS barnyard relaed Heavy Use Area Protection according to engineering design to contain livestock. Permanently installed fence built to manage livestock within the barnyard. This is a facilitating practice to access control because fence is not 'bundled' into the Heavy Use Area Protection practice scenarios. Fence surrounds a typical 100 X 50 foot barnyard on 3 sides with a building typically making up the 4th 100 foot side of foot print. This gives a typical size of 200 feet with 184 feet of wooden post fence and 16 feet of rail tube gate. The fence itself is composed of 8 foot long 6'X6' posts on 8 foot centers with the slats composed of three 6'X2'X8' treated lumber.

Before Situation:

Where a NRCS designed and constructed barnyard related heavy use area protection is planned whereby significant risk to livestock containment is determined to be evident. Lack of livestock containment fencing may cause detrimental effect to animal/human health and water quality. Resource concerns affected are runoff of sediment or water quality due to manure runoff.

After Situation:

Livestock and associated manure will be contained within the barnyard related heavy use area protection. The fence would typically be located along the wall of the barnyard with one gate. Wooden post and board construction with a gate is typical. Livestock containment will facilitate the effectiveness of the barnyard heavy use area protection.

Feature Measure: length of fence

Scenario Unit: Feet

Scenario Typical Size: 200.00

Scenario Total Cost: $3,195.97

Scenario Cost/Unit: $15.98

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hours	$9.89	6	$59.34
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	3	$76.08
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$36.34	6	$218.04
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	13	$373.23
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	6	$182.16
Materials						
Post, Wood, CCA treated, 6 in. x 8 ft.	12	Wood Post, End 6 inch dia. X 8 ft., CCA Treated. Includes materials and shipping only.	Each	$25.26	27	$682.02
Dimension Lumber, Treated	1044	Treated dimension lumber with nominal thickness equal or less than 2 inches. Includes lumber and fasteners	Board Feet	$1.79	552	$988.08
Gate, Pipe, 16 ft.	1059	6 rail tube gate, 16 gauge. Includes materials and shipping only.	Each	$313.08	1	$313.08
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 382 - Fence

Scenario: #67 - Multi Strand Barbed/Smooth Wire

Scenario Description:

Multi-strand, Barbed or Smooth Wire - Installation of fence will allow for implementation of grazing management that allows for an adequate rest and recovery period, protection of sensitive area, improved water quality, reduction of noxious and invasive weeds. Constructed using fencing materials rather than a pre-manufactured gate.

Before Situation:

On grazing lands health and vigor are negatively impacted by poor grazing distribution, timing of grazing and inadequate rest and recovery periods. Water quality is impacted by increased erosion and runoff, cattle access to water bodies is uncontrolled. Reduced vegetative cover increases the opportunity for encroachment of noxious and invasive weeds.

After Situation:

Installation of fence will allow for implementation of grazing management that allows for an adequate rest and recovery period, protection of sensitive area, improved water quality, reduction of noxious and invasive weeds. Fence includes posts, wire, fasteners, gates, etc... Four strand wire is commonly installed. Fence will be installed with wildlife friendly considerations.

Feature Measure: Length of Fence

Scenario Unit: Feet

Scenario Typical Size: 1,320.00

Scenario Total Cost: $3,846.91

Scenario Cost/Unit: $2.91

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hours	$9.89	5	$49.45
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	5	$126.80
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$36.34	5	$181.70
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	33	$947.43
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	5	$151.80
Materials						
Wire, Barbed, Galvanized, 12.5 Gauge, 1,320' roll	1	Galvanized 12.5 gauge, 1,320' roll. Includes materials and shipping only.	Each	$125.50	4	$502.00
Post, Wood, CCA treated, 3-4 in. x 7 ft.	9	Wood Post, Line 3-4 inch dia. X 7 ft., CCA Treated. Includes materials and shipping only.	Each	$11.38	20	$227.60
Post, Wood, CCA treated, 6 in. x 8 ft.	12	Wood Post, End 6 inch dia. X 8 ft., CCA Treated. Includes materials and shipping only.	Each	$25.26	8	$202.08
Post, Steel T, 1.33 lbs, 6 ft.	15	Steel Post, Studded 6 ft. - 1.33 lb. Includes materials and shipping only.	Each	$7.23	90	$650.70
Fence, Wire Assembly, Barbed Wire	30	Brace pins, battens, clips, staples. Includes materials and shipping only.	Feet	$0.20	1320	$264.00
Gate, Pipe, 12 ft.	1057	6 rail tube gate, 16 gauge. Includes materials and shipping only.	Each	$239.41	1	$239.41
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 382 - Fence

Scenario: #75 - Confinement

Scenario Description:
Installation of fence reduces resource concerns associated with livestock feeding operations and/or wildlife access to prevent conflicts between humans and livestock or wildlife species.

Before Situation:
Wildlife negatively impacting sensitive areas such as riparian areas, windbreaks and shelterbelts or feed storage. Disease transmission from wildlife posses a significant health risk to domestic animals.

After Situation:
Installation of fence reduces resource concerns associated with livestock and/or wildlife access and prevents conflicts between humans and threatened, endangered or sensitive species. Fence includes posts, wire, fasteners, gates, etc...

Feature Measure: Length of Fence

Scenario Unit: Feet

Scenario Typical Size: 1,320.00

Scenario Total Cost: $8,225.28

Scenario Cost/Unit: $6.23

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hours	$9.89	5	$49.45
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	4	$101.44
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$36.34	5	$181.70
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	60	$1,722.60
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	5	$151.80
Materials						
Wire, Woven, Wildlife, 96 in.	6	High Tensile 12.5 gauge, 96 inch - 330 foot roll. Includes materials and shipping only.	Each	$711.97	4	$2,847.88
Post, Wood, CCA treated, 6 in. x 8 ft.	12	Wood Post, End 6 inch dia. X 8 ft., CCA Treated. Includes materials and shipping only.	Each	$25.26	8	$202.08
Post, Wood, CCA treated, 6 in. x 12-14 ft.	13	Wood Post, Line/End 6 inch dia. X 12-14 ft., CCA Treated. Includes materials and shipping only.	Each	$38.98	20	$779.60
Post, Steel T, 1.33 lbs, 10 ft.	17	Steel Post, Studded 10 ft. - 1.33 lb. Includes materials and shipping only.	Each	$12.88	90	$1,159.20
Gate, Game, 8 ft. High X 16 ft. Wide	1086	16 ft. Wide Game Gate (8 ft. tall). Includes materials and shipping only.	Each	$725.59	1	$725.59
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 382 - Fence

Scenario: #132 - Woven Wire

Scenario Description:
Woven - Installation of fence will allow for implementation of a grazing management that allows for an adequate rest and recovery period, protection of sensitive area, improved water quality, reduction of noxious and invasive weeds. Woven wire is typically used in applications with sheep, goats, hogs, wildlife exclusion, shelterbelt/tree protection, etc. Constructed using fencing materials rather than a pre-manufactured gate.

Before Situation:
On grazing lands health and vigor are negatively impacted by poor grazing distribution, timing of grazing and inadequate rest and recovery periods. Water quality is impacted by increased erosion and runoff, livestock access to water bodies is uncontrolled. Reduced vegetative cover increases opportunity for encroachment of noxious and invasive weeds.

After Situation:
Installation of fence will allow for implementation of a rotational grazing plan that allows for an adequate rest and recovery period, protection of sensitive area, improved water quality, reduction of noxious and invasive weeds. Woven wire fence includes posts, wire, fasteners, gates, etc... Woven wire is typically used in applications with sheep, goats, hogs, wildlife exclusion, shelterbelt/tree protection, etc.

Feature Measure: Length of Fence

Scenario Unit: Feet

Scenario Typical Size: 1,320.00

Scenario Total Cost: $4,934.55

Scenario Cost/Unit: $3.74

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hours	$9.89	5	$49.45
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	5	$126.80
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$36.34	5	$181.70
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	45	$1,291.95
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	5	$151.80
Materials						
Wire, Barbed, Galvanized, 12.5 Gauge, 1,320' roll	1	Galvanized 12.5 gauge, 1,320' roll. Includes materials and shipping only.	Each	$125.50	2	$251.00
Wire, Woven, Galvanized, 12.5 Gauge, 32 in	3	Galvanized 12.5 gauge, 32 inch - 330 foot roll. Includes materials and shipping only.	Each	$199.03	4	$796.12
Post, Wood, CCA treated, 3-4 in. x 7 ft.	9	Wood Post, Line 3-4 inch dia. X 7 ft., CCA Treated. Includes materials and shipping only.	Each	$11.38	20	$227.60
Post, Wood, CCA treated, 6 in. x 8 ft.	12	Wood Post, End 6 inch dia. X 8 ft., CCA Treated. Includes materials and shipping only.	Each	$25.26	8	$202.08
Post, Steel T, 1.33 lbs, 6 ft.	15	Steel Post, Studded 6 ft. - 1.33 lb. Includes materials and shipping only.	Each	$7.23	90	$650.70
Fence, Wire Assembly, Barbed Wire	30	Brace pins, battens, clips, staples. Includes materials and shipping only.	Feet	$0.20	1320	$264.00
Fence, Wire Assembly, Woven Wire	35	Brace pins, twist sticks, staples. Includes materials and shipping only.	Feet	$0.15	1320	$198.00
Gate, Pipe, 12 ft.	1057	6 rail tube gate, 16 gauge. Includes materials and shipping only.	Each	$239.41	1	$239.41
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 382 - Fence

Scenario: #133 - Electric

Scenario Description:
Electric - Installation of fence will allow for implementation of a grazing management that allows for an adequate rest and recovery period, protection of sensitive area, improved water quality, reduction of noxious and invasive weeds.

Before Situation:
On grazinglands health and vigor are negatively impacted by poor grazing distribution, timing of grazing and inadequate rest and recovery periods. Water quality is impacted by increased erosion and runoff, cattle access to water bodies is uncontrolled. Reduced vegetative cover increases the opportunity for encroachment of noxious and invasive weeds.

After Situation:
Installation of fence will allow for implementation of grazing management that allows for an adequate rest and recovery period, protection of sensitive area, improved water quality, reduction of noxious and invasive weeds. Fence includes posts, wire, fasteners, gates, fence charger, etc... Two to three strand wire is commonly installed. Fence will be installed with wildlife friendly considerations.

Feature Measure: Length of Fence

Scenario Unit: Feet

Scenario Typical Size: 1,320.00

Scenario Total Cost: $3,169.93

Scenario Cost/Unit: $2.40

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hours	$9.89	3	$29.67
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	2	$50.72
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$36.34	3	$109.02
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	20	$574.20
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	3	$91.08
Materials						
Post, Wood, CCA treated, 3-4 in. x 7 ft.	9	Wood Post, Line 3-4 inch dia. X 7 ft., CCA Treated. Includes materials and shipping only.	Each	$11.38	2	$22.76
Post, Wood, CCA treated, 6 in. x 8 ft.	12	Wood Post, End 6 inch dia. X 8 ft., CCA Treated. Includes materials and shipping only.	Each	$25.26	8	$202.08
Post, Fiberglass, 7/8 in X 6 ft	18	Fiberglass line post, 7/8 inch diameter X 6 foot length. Includes materials and shipping only.	Each	$13.56	60	$813.60
Electric, Ground Rods	20	Electric, Ground Rod for electric fence. Includes materials and shipping only.	Each	$17.70	6	$106.20
Electric, Ground Rod Clamps	21	Electric, Ground Rod Clamps for electric fence. Includes materials and shipping only.	Each	$2.53	6	$15.18
Electric, Lightening Diverter	22	Electric, Lightening diverter for electric fence. Includes materials and shipping only.	Each	$10.27	1	$10.27
Electric, Insulated cable	23	Electric, Insulated cable for electric fence. Typically in spools of 100 to 200 feet. Includes materials and shipping only.	Each	$41.90	1	$41.90
Electric, Tester	26	Electric, Tester for electric fence. Includes materials and shipping only.	Each	$46.17	1	$46.17
Electric, Energizer, 6 joule	29	Electric, Energizer, 6 joule for electric fence. Includes materials and shipping only.	Each	$427.97	1	$427.97
Fence, Wire Assembly, High Tensile, Electric, 2 Strand	33	Brace pins, springs, strainers, battens, clips, crimp sleeves, staples, insulators, wrap around sleeves. Includes materials and shipping only.	Feet	$0.08	1320	$105.60
Gate, Pipe, 10 ft.	1056	6 rail tube gate, 16 gauge. Includes materials and shipping only.	Each	$219.57	1	$219.57
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 382 - Fence

Scenario: #144 - Multi Strand Barbed or smooth Wire Difficult terrain

Scenario Description:

Barbed, Smooth ,or Woven Wire Difficult Installation - Installation of fence in difficult situations will allow for implementation of grazing management that allows for an adequate rest and recovery period, protection of sensitive area, improved water quality, reduction of noxious and invasive weeds. Constructed using fencing materials rather than a pre-manufactured gate.

Before Situation:

On grazing lands health and vigor are negatively impacted by poor grazing distribution, timing of grazing and inadequate rest and recovery periods. Water quality is impacted by increased erosion and runoff, cattle access to water bodies is uncontrolled. Reduced vegetative cover increases the opportunity for encroachment of noxious and invasive weeds. Fence installation conditions are for difficult sites such as poor access, steep slopes, rocky sites, dense brush, wet conditions etc.

After Situation:

Installation of fence will allow for implementation of grazing management that allows for an adequate rest and recovery period, protection of sensitive area, improved water quality, reduction of noxious and invasive weeds. Fence includes posts, wire, fasteners, gates, brace posts, etc... Fence will be installed with wildlife friendly considerations.

Feature Measure: Length of Fence

Scenario Unit: Feet

Scenario Typical Size: 1,320.00

Scenario Total Cost: $5,011.33

Scenario Cost/Unit: $3.80

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hours	$9.89	10	$98.90
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	1	$6.30
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	5	$126.80
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$36.34	10	$363.40
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	60	$1,722.60
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	10	$303.60
Materials						
Wire, Barbed, Galvanized, 12.5 Gauge, 1,320' roll	1	Galvanized 12.5 gauge, 1,320' roll. Includes materials and shipping only.	Each	$125.50	4	$502.00
Post, Wood, CCA treated, 3-4 in. x 7 ft.	9	Wood Post, Line 3-4 inch dia. X 7 ft., CCA Treated. Includes materials and shipping only.	Each	$11.38	20	$227.60
Post, Wood, CCA treated, 6 in. x 8 ft.	12	Wood Post, End 6 inch dia. X 8 ft., CCA Treated. Includes materials and shipping only.	Each	$25.26	8	$202.08
Post, Steel T, 1.33 lbs, 6 ft.	15	Steel Post, Studded 6 ft. - 1.33 lb. Includes materials and shipping only.	Each	$7.23	90	$650.70
Fence, Wire Assembly, Barbed Wire	30	Brace pins, battens, clips, staples. Includes materials and shipping only.	Feet	$0.20	1320	$264.00
Gate, Pipe, 12 ft.	1057	6 rail tube gate, 16 gauge. Includes materials and shipping only.	Each	$239.41	1	$239.41
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 382 - Fence

Scenario: #155 - Large Animal Perimeter 96 Inch Woven Wire

Scenario Description:

Woven Wire fencing installed for large livestock such as Bison, large ungulate herbivores, captive cervidae that are not domesticated. Because of the size and behavior differences relative to domesticated livestock, fences, handling facilities and loading facilities must be more robust to accommodate bison. Fence allows for the implementation of a grazing management under a CPS 528 Prescribed Grazing plan. Fence facilities the movement of livestock for forage management and protection of sensitive areas. All fence components are included. Fence encloses <= 20 acres or 2640 foot linear run connection with 5-8 wire fencing. Install fence with considerations for wildlife corridors.

Before Situation:

Livestock have access to forage and sensitive areas without management of intensity, duration and frequency of grazing events.Plant productivity and health is degraded. Water quality may be impaired by sediment and livestock access to water.

After Situation:

Installation of the tall woven wire high tensile electric fence allows for grazing management to be implemented. Fence is installed to specifications meeting the producer's objective and livestock type. Fence is installed with wildlife friendly considerations and known wildlife corridors.

Feature Measure: length

Scenario Unit: Feet

Scenario Typical Size: 2,640.00

Scenario Total Cost: $21,836.30

Scenario Cost/Unit: $8.27

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hours	$9.89	40	$395.60
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	40	$1,014.40
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$36.34	40	$1,453.60
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	40	$725.20
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	120	$3,445.20
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	40	$1,214.40
Materials						
Wire, Woven, Wildlife, 96 in.	6	High Tensile 12.5 gauge, 96 inch - 330 foot roll. Includes materials and shipping only.	Each	$711.97	8	$5,695.76
Post, Wood, CCA treated, 6 in. x 8 ft.	12	Wood Post, End 6 inch dia. X 8 ft., CCA Treated. Includes materials and shipping only.	Each	$25.26	4	$101.04
Post, Wood, CCA treated, 6 in. x 12-14 ft.	13	Wood Post, Line/End 6 inch dia. X 12-14 ft., CCA Treated. Includes materials and shipping only.	Each	$38.98	160	$6,236.80
Fence, Wire Assembly, Woven Wire	35	Brace pins, twist sticks, staples. Includes materials and shipping only.	Feet	$0.15	2640	$396.00
Gate, Pipe, 14 ft.	1058	6 rail tube gate, 16 gauge. Includes materials and shipping only.	Each	$275.21	2	$550.42
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	2	$607.88

Practice: 382 - Fence

Scenario: #171 - Large Animal 8 Wire High Tensile, Electric

Scenario Description:
A high tensile wire fence which is electrified for large livestock such as Bison, large ungulate herbivores, captive cervidae that are not domesticated. Eight strands of wire are used for visual barrier with a minimum of 3 wires electrified. Fence allows for the implementation of a grazing management plan. Because of the size and behavior differences relative to domesticated livestock, fences, handling facilities and loading facilities must be more robust to accommodate bison. Fence allows for the implementation of grazing management under CPS Prescribed Grazing plan. Fence facilities the movement of livestock for forage management and protection of sensitive areas. All fence components are included. Fence encloses 40 acres. Install fence considering wildlife and known wildlife corridors.

Before Situation:
Livestock have access to forage and sensitive areas without management of intensity, duration and frequency of grazing events. Plant productivity and health is degraded. Water quality may be impaired by sediment and livestock access to water.

After Situation:
Installation of the 8 wire high tensile electric fence allows for grazing management to be implemented. Fence is installed to specifications meeting the producer's objective and livestock type. Fence is installed with wildlife friendly considerations and known wildlife corridors.

Feature Measure: lenght

Scenario Unit: Feet

Scenario Typical Size: 5,280.00

Scenario Total Cost: $17,299.98

Scenario Cost/Unit: $3.28

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hours	$9.89	53	$524.17
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	40	$1,014.40
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$36.34	53	$1,926.02
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	42	$761.46
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	88	$2,526.48
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	53	$1,609.08
Materials						
Wire, High Tensile, 12.5 Gauge, 4,000' roll	2	High Tensile 12.5 gauge, 4,000' roll. Includes materials and shipping only.	Each	$158.31	11	$1,741.41
Post, Wood, CCA treated, 4 in x 8 ft	10	Wood Post, Line 4 inch X 8 foot, CCA Treated. Includes materials and shipping only.	Each	$13.92	188	$2,616.96
Post, Wood, CCA treated, 6 in. x 8 ft.	12	Wood Post, End 6 inch dia. X 8 ft., CCA Treated. Includes materials and shipping only.	Each	$25.26	26	$656.76
Electric, Ground Rods	20	Electric, Ground Rod for electric fence. Includes materials and shipping only.	Each	$17.70	7	$123.90
Electric, Ground Rod Clamps	21	Electric, Ground Rod Clamps for electric fence. Includes materials and shipping only.	Each	$2.53	7	$17.71
Electric, Lightening Diverter	22	Electric, Lightening diverter for electric fence. Includes materials and shipping only.	Each	$10.27	1	$10.27
Electric, Insulated cable	23	Electric, Insulated cable for electric fence. Typically in spools of 100 to 200 feet. Includes materials and shipping only.	Each	$41.90	1	$41.90
Electric, Power Surge Protector	24	Electric, Power Surge Protector for electric fence. Includes materials and shipping only.	Each	$15.48	1	$15.48
Electric, Cutoff Switch	25	Electric, Cutoff Switch for electric fence. Includes materials and shipping only.	Each	$11.17	2	$22.34
Electric, Tester	26	Electric, Tester for electric fence. Includes materials and shipping only.	Each	$46.17	1	$46.17
Electric, Energizer, 6 joule	29	Electric, Energizer, 6 joule for electric fence. Includes materials and shipping only.	Each	$427.97	1	$427.97

Fence, Wire Assembly, High Tensile, Electric, 3 Strand	34	Brace pins, springs, strainers, battens, clips, crimp sleeves, staples, insulators, wrap around sleeves. Includes materials and shipping only.	Feet	$0.15	13728	$2,059.20
Gate, Pipe, 14 ft.	1058	6 rail tube gate, 16 gauge. Includes materials and shipping only.	Each	$275.21	2	$550.42
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	2	$607.88

Practice: 382 - Fence

Scenario: #187 - Large Animal 5 Wire High Tensile, Electric

Scenario Description:
A five strand high tensile wire fence which is electrified for large livestock such as Bison, large ungulate herbivores, captive cervidae that are not domesticated. Because of the size and behavior differences relative to domesticated livestock, fences, handling facilities and loading facilities must be more robust to accommodate bison. Fence allows for the implementation of a grazing management under CPS 528 Prescribed Grazing plan. Fence facilities the movement of livestock for forage management and protection of sensitive areas. All fence components are included. Fence encloses 40 acres. Install fence considering wildlife friendly design and adjustment for wildlife corridors.

Before Situation:
Livestock have access to forage and sensitive areas without management of intensity, duration and frequency of grazing events.Plant productivity and health is degraded. Water quality may be impaired by sediment and livestock access to water.

After Situation:
Installation of the 5 wire high tensile electric fence allows for grazing management to be implemented. Fence is installed to specifications meeting the producer's objective and livestock type. Fence is installed with wildlife friendly considerations and known wildlife corridors.

Feature Measure: length

Scenario Unit: Feet

Scenario Typical Size: 5,280.00

Scenario Total Cost: $15,563.00

Scenario Cost/Unit: $2.95

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hours	$9.89	53	$524.17
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	40	$1,014.40
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$36.34	53	$1,926.02
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	20	$362.60
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	80	$2,296.80
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	53	$1,609.08
Materials						
Wire, High Tensile, 12.5 Gauge, 4,000' roll	2	High Tensile 12.5 gauge, 4,000' roll. Includes materials and shipping only.	Each	$158.31	7	$1,108.17
Post, Wood, CCA treated, 4 in x 8 ft	10	Wood Post, Line 4 inch X 8 foot, CCA Treated. Includes materials and shipping only.	Each	$13.92	188	$2,616.96
Post, Wood, CCA treated, 6 in. x 8 ft.	12	Wood Post, End 6 inch dia. X 8 ft., CCA Treated. Includes materials and shipping only.	Each	$25.26	26	$656.76
Electric, Ground Rods	20	Electric, Ground Rod for electric fence. Includes materials and shipping only.	Each	$17.70	7	$123.90
Electric, Ground Rod Clamps	21	Electric, Ground Rod Clamps for electric fence. Includes materials and shipping only.	Each	$2.53	7	$17.71
Electric, Lightening Diverter	22	Electric, Lightening diverter for electric fence. Includes materials and shipping only.	Each	$10.27	1	$10.27
Electric, Insulated cable	23	Electric, Insulated cable for electric fence. Typically in spools of 100 to 200 feet. Includes materials and shipping only.	Each	$41.90	1	$41.90
Electric, Power Surge Protector	24	Electric, Power Surge Protector for electric fence. Includes materials and shipping only.	Each	$15.48	1	$15.48
Electric, Cutoff Switch	25	Electric, Cutoff Switch for electric fence. Includes materials and shipping only.	Each	$11.17	2	$22.34
Electric, Tester	26	Electric, Tester for electric fence. Includes materials and shipping only.	Each	$46.17	1	$46.17
Electric, Energizer, 6 joule	29	Electric, Energizer, 6 joule for electric fence. Includes materials and shipping only.	Each	$427.97	1	$427.97

Fence, Wire Assembly, High Tensile, Electric, 3 Strand	34	Brace pins, springs, strainers, battens, clips, crimp sleeves, staples, insulators, wrap around sleeves. Includes materials and shipping only.	Feet	$0.15	10560	$1,584.00
Gate, Pipe, 14 ft.	1058	6 rail tube gate, 16 gauge. Includes materials and shipping only.	Each	$275.21	2	$550.42
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	2	$607.88

Practice: 383 - Fuel Break

Scenario: #30 - Fuel Break

Scenario Description:

Fuel Break installation requires tree thinning, treating woody residue, pruning, and mowing. Thinning treatment and pruning is done by hand, treating woody residue (piling/burning, crushing, or off-site removal) and mowing are mechanized. Resource concerns are degraded plant condition - wildfire hazard, excess biomass accumulation & undesirable productivity and health.

Before Situation:

Forest stand is overstocked with desirable and undesirable trees. Overstocking creates conditions conducive to wildfire movement across the landscape, and severe loss/damage of the forest stand. Shrub levels are high and significanly increase wildfire risk. Tree crowns are touching, trees retain limbs down to understory vegetation creating a 'ladder' for fire movement into the overstory, and understory vegetation (brush and grasses) create a significant fuel load to rate a high to severe fire hazard. The terrain is moderately to steeply sloped (1-30%), increasing difficulty as slope steepens.

After Situation:

Fuel Break is installed at the property line or a key locations to reduce crown fire spread. Size of fuel break is 4 acres; the width varies due to site conditions. The trees are thinned so open gaps are created in crown overstory, branches on remaining trees are pruned to 8 to 10 feet in height, all woody residue (thinned trees and pruned branches) are treated (piled/burned or lopped/scattered) so little remains in the fuel break and understory vegetation is mowed down to less than 1 foot in height. Cut stumps have been chemically treated to control sprouting.

Feature Measure: Area of Treatment

Scenario Unit: Acres

Scenario Typical Size: 4.00

Scenario Total Cost: $7,492.67

Scenario Cost/Unit: $1,873.17

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$100.26	10	$1,002.60
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	80	$504.00
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	8	$202.88
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hours	$31.60	8	$252.80
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$81.82	8	$654.56
Pruning tools, hand tools	1318	Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included.	Hours	$2.31	8	$18.48
Pruning tool, pole saw	1319	Gasoline powered pole chainsaw. Labor not included.	Hours	$9.80	8	$78.40
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	80	$2,296.80
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	8	$242.88
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	10	$401.30
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	12	$583.20
Materials						
Tree Marking Paint	313	Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only.	Acres	$12.39	4	$49.56
Herbicide, Triclopyor	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acres	$34.16	4	$136.64
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 383 - Fuel Break

Scenario: #41 - Hand Fuel Break

Scenario Description:

Fuel Break installation requires tree thinning, treating woody residue, pruning, and mowing. Thinning treatment, pruning, brush cutting and treating woody residue (piling/burning, crushing, or off-site removal), is done by hand. Resource concerns are degraded plant condition - wildfire hazard, excess biomass accumulation & undesirable productivity and health.

Before Situation:

Forest stand is overstocked with desirable and undesirable trees. Overstocking creates conditions conducive to wildfire movement across the landscape, and loss of the forest stand. Excess stocking is impacting the health of the desired forest ecosystem and wildfire hazard poses risk to humans, structures, air quality, plants and animals. Tree crowns are touching, trees retain limbs down to understory vegetation creating a 'ladder' for fire movement into the overstory, and understory vegetation (brush and grasses) create a significant fuel load.

After Situation:

A fuel break is installed by hand cutting trees, hand pruning remaining trees, piling and burning or removal of woody residue from tree cutting and pruning. FB installation is at property lines, around structures, at roadways, or other key locations to reduce continuity of vegetation cover. Width of fuel break varies based on site conditions.

Feature Measure: Area of Treatment

Scenario Unit: Acres

Scenario Typical Size: 4.00

Scenario Total Cost: $9,362.58

Scenario Cost/Unit: $2,340.65

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	240	$1,512.00
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	12	$304.32
Pruning tools, hand tools	1318	Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included.	Hours	$2.31	10	$23.10
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	240	$6,890.40
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	12	$583.20
Materials						
Tree Marking Paint	313	Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only.	Acres	$12.39	4	$49.56

Practice: 383 - Fuel Break

Scenario: #42 - Non Forest Fuel Break

Scenario Description:
A non forest fuel break occurs outside of forestlands where brush, grass and forbs dominate. Landuses where this scenario will be applied may be range, pasture or wetlands. The fuel break area is mowed/bushhog so standing vegetation is reduced to a low height. Resource concerns are degraded plant condition - wildfire hazard.

Before Situation:
Wildfire movement is a concern within the designated area. Vegetation is tall, dense and continuous creating conditions conducive for fire movement across the landscape.

After Situation:
A fuel break is installed by shredding/mowing/bushhogging a defined width at property lines, around structures, at roadways, or other key locations to reduce continuity of vegetation cover. Width of fuel break varies based on site conditions.

Feature Measure: Area of Treatment

Scenario Unit: Acres

Scenario Typical Size: 4.00

Scenario Total Cost: $1,329.66

Scenario Cost/Unit: $332.42

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	4	$101.44
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hours	$31.60	8	$252.80
Mechanical weed control, Vegetation termination	957	Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs.	Acres	$27.07	8	$216.56
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	4	$114.84
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	8	$242.88
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	2	$97.20
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 384 - Woody Residue Treatment

Scenario: #2 - Restoration or conservation treatment following catastrophic events

Scenario Description:
The use of a combination of hand (chainsaw) and heavy equipment similar to those used in logging to treat slash resulting from catastrophic events such as fire, wind, severe pest outbreak, ice storm, etc. This scenario will remove/treat the larger material the size of which is consistent with the large equipment used.

Before Situation:
A large amount of slash and woody residue is created as a result of a non-silvicultural event such as a wind storm, wildfire, ice storm, pest outbreak, etc. Because the slash and residue is created by a catastrophic event that can cause tree-lodging, snags, broken tops, etc.; treatment is both difficult and dangerous. The presence of this material causes adverse effects on the forest including limited access for management purposes, increasing the wildfire hazard, increasing the risk of potential harm to humans and livestock, and providing harboring sites for pests.

After Situation:
The material resulting from the catastrophic event is reduced to a level that will minimize insect and disease outbreaks, reduce wildfire risk and risk to human and livestock.

Feature Measure: Acres of affected forest

Scenario Unit: Acres

Scenario Typical Size: 20.00

Scenario Total Cost: $16,530.06

Scenario Cost/Unit: $826.50

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Track Loader, 95HP	935	Equipment and power unit costs. Labor not included.	Hours	$97.06	40	$3,882.40
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	80	$504.00
Log skidder	942	Equipment and power unit costs. Labor not included.	Hours	$61.64	40	$2,465.60
Truck, dump, 8 CY	1401	Dump truck for moving bulk material. Typically capacity is 12 ton or 8 cubic yards. Includes equipment only.	Hours	$55.22	40	$2,208.80
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	80	$2,296.80
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	120	$3,643.20
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 384 - Woody Residue Treatment

Scenario: #3 - Woody residue or silvicultural slash treatment, light

Scenario Description:
Treating an area of forest slash to reduce hazardous fuels and the risk of insect and disease, improve organic matter and reduce erosion while improving access for management activities and livestock, and improving the site for natural or artificial regeneration. Slash is treated with both hand (cutting, lopping, etc.) and mechanically (masticating, chipping, etc.). Typically done by hand and light equipment.

Before Situation:
Woody material resulting from a silvicultural practice such as pruning or a light thinning operation increases the risk of wildfire, insect and pest outbreaks and soil erosion, impeding access for people and livestock and suppressing regeneration efforts.

After Situation:
Fire and pest risks are reduced with slash spread out and in contact with the ground thereby increasing soil organic matter and improving the site for regeneration. Access for managing the forest or livestock is unimpeded and safe.

Feature Measure: Acres treated

Scenario Unit: Acres

Scenario Typical Size: 40.00

Scenario Total Cost: $8,994.74

Scenario Cost/Unit: $224.87

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	80	$504.00
Mechanical cutter, chopper	943	Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included.	Hours	$116.89	40	$4,675.60
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	80	$2,296.80
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	40	$1,214.40
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 384 - Woody Residue Treatment

Scenario: #4 - Chipping and hauling off site

Scenario Description:
Reducing woody waste created during forestry, agroforestry and horticultural activities by gathering, chipping, and hauling off site to reduce hazardous fuels, improve access for management activities, livestock and wildlife, and improve the site for natural and artificial regeneration. Does not include transport from property to a commercial facility.

Before Situation:
Woody residues are causing resource concerns with management access, increased wildfire, insect and disease risk, and impeding regeneration.

After Situation:
Excessive woody residues are reduced to a level that does not impede management activities, regeneration, access for livestock and wildlife and reduces hazardous fuels.

Feature Measure: Acres treated

Scenario Unit: Acres

Scenario Typical Size: 20.00

Scenario Total Cost: $6,281.37

Scenario Cost/Unit: $314.07

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	20	$126.00
Brush Chipper, 6 in. capacity	938	Brush Chipper, 6 inch capacity, typically 35 HP. Includes chipper and power unit. Labor not included.	Hours	$34.98	20	$699.60
Log skidder	942	Equipment and power unit costs. Labor not included.	Hours	$61.64	10	$616.40
Truck, dump, 8 CY	1401	Dump truck for moving bulk material. Typically capacity is 12 ton or 8 cubic yards. Includes equipment only.	Hours	$55.22	20	$1,104.40
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	40	$1,148.40
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	50	$1,518.00
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 384 - Woody Residue Treatment

Scenario: #5 - Forest Slash Treatment, Medium and or Heavy

Scenario Description:
Treating an area of significant woody plant residues to reduce hazardous fuels and the risk of insect and disease, improve soil organic matter, decrease risk of harm to people and livestock, and improve site for natural and artificial regeneration. Slash is to be lopped/treated/crushed within a foot of the ground or moved off site to meet state fire hazard reduction standards. Typically heavy equipment is used such as masticators, mulchers, drum choppers, etc. Hand work with chainsaws are used on steep slopes.

Before Situation:
Heavy woody material (difficult to walk through) resulting from silvicultural/management operations caused both fire hazard, access, potential harm to humans and animals, and pest issues.

After Situation:
Fire and pest risks are reduced with slash spread out and in contact with the ground thereby increasing soil organic matter and improving the site for regeneration. Access for managing the forest or livestock is unimpeded and safe.

Feature Measure: Acres treated

Scenario Unit: Acres

Scenario Typical Size: 40.00

Scenario Total Cost: $10,297.82

Scenario Cost/Unit: $257.45

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	40	$252.00
Heavy mechanical site prep, drum chopping	1316	Mechanical operations that pushing trees and vegetation and crushing them with a water filled roller chopper. Requires heavy equipment such as dozers. Includes equipment, power unit and labor costs.	Acres	$149.88	40	$5,995.20
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	40	$1,148.40
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	40	$1,214.40
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 386 - Field Border

Scenario: #5 - Field Border, Native Species

Scenario Description:
A strip of permanent vegetation established at the edge or around the perimeter of an agricultural field. Practice includes seedbed prep and planting of organic seed for herbaceous species.

Before Situation:
Before practice conditions may vary widely. Fields may have erosion issues from wind or water, a field border may be needed to manage pest populations, protect soil and water quality, provide wildlife food and cover, provide pollinator habitat, or a field border may be used to increase carbon storage and improve air quality. Water quality, soil erosion and/or wildlife food and cover may all be primary resource concerns.

After Situation:
The 386 Implementation Requirements have been developed and applied for the site. This practice when applied around a field may support and connect other buffer practices while creating a buffer between organic systems and conventional cropping systems. Native grasses and legumes will be established in the field border to the extent needed to meet the resource needs and producer objectives. Minimum field border widths shall be based on NRCS local design criteria specific to the purpose for installing the practice. Species selected shall be adapted to the site, not function as a host for diseases of a field crop, and have physical characteristics necessary to control wind and water erosion to tolerable levels on the field border area.

Feature Measure: number of acres

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $201.88

Scenario Cost/Unit: $201.88

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	3	$44.64
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	1	$22.27
Materials						
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$134.97	1	$134.97

Practice: 386 - Field Border

Scenario: #6 - Field Border, Introduced Species

Scenario Description:
A strip of permanent vegetation established at the edge or around the perimeter of an agricultural field. Practice includes seedbed prep and planting of introduced species.

Before Situation:
Before practice conditions may vary widely. Fields may have erosion issues from wind or water, a field border may be needed to manage pest populations, protect soil and water quality, provide wildlife food and cover, provide pollinator habitat, or a field border may be used to increase carbon storage and improve air quality. Water quality, soil erosion and/or wildlife food and cover may all be primary resource concerns.

After Situation:
The 386 Implementation Requirements have been developed and applied for the site. This practice when applied around a field may support and connect other buffer practices within and between fields. Introduced grasses and legumes will be established in the field border to the extent needed to meet the resource needs and producer objectives. Minimum field border widths shall be based on NRCS local design criteria specific to the purpose for installing the practice. Species selected shall be adapted to site, will not function as a host for diseases of a field crop, and have physical characteristics necessary to control wind and water erosion to tolerable levels on the field border area.

Feature Measure: Number of acres

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $121.51

Scenario Cost/Unit: $121.51

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	1	$14.88
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	1	$22.27
Materials						
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	30	$20.40
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.81	20	$16.20
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$47.76	1	$47.76

Practice: 386 - Field Border

Scenario: #7 - Field Border, Pollinator

Scenario Description:
A strip of permanent vegetation established at the edge or around the perimeter of a field. This practice may also apply to recreation land or other land uses where agronomic crops including forages are grown. Practice includes seedbed prep and planting of pollinator friendly species.

Before Situation:
Before practice conditions may vary widely. Fields may have erosion issues from wind or water, a field border may be needed to manage pest populations, protect soil and water quality, provide wildlife food and cover, provide pollinator habitat, or a field border may be used to increase carbon storage and improve air quality. Water quality, soil erosion and/or wildlife food and cover may all be primary resource concerns.

After Situation:
The 386 Implementation Requirements have been developed and applied for the site. This practice when applied around a field may support and connect other buffer practices within and between fields. Pollinator herbaceous plantings will provide species which flower throughout the growing season. This provides a source of nectar for adult pollinators and a diversity of herbaceous material for immature pollinator life stages and for nesting. Minimum field border widths shall be based on NRCS local design criteria specific to the purpose for installing the practice. Species selected shall be adapted to site, will not function as a host for diseases of a field crop, and have physical characteristics necessary to control wind and water erosion to tolerable levels on the field border area.

Feature Measure: Number of acres

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $536.72

Scenario Cost/Unit: $536.72

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	3	$44.64
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	1	$22.27
Materials						
Native Perennial Grasses, Legumes and/or Forb Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, moderate commercial availability	2619	Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed is moderately easy to purchase commercially. Includes materials and shipping.	Acres	$469.81	1	$469.81

Practice: 386 - Field Border

Scenario: #12 - PIA - Field Border

Scenario Description:
A strip of permanent vegetation established at the edge or around the perimeter of an agricultural field. Practice includes seedbed prep and planting of native species. The area of the field border is taken out of production.

Before Situation:
Before practice conditions may vary widely. Fields may have erosion issues from wind or water, a field border may be needed to manage pest populations, protect soil and water quality, provide wildlife food and cover, provide pollinator habitat, or a field border may be used to increase carbon storage and improve air quality. Water quality, soil erosion and/or wildlife food and cover may all be primary resource concerns.

After Situation:
The 386 Implementation Requirements have been developed and applied for the site. This practice when applied around a field may support and connect other buffer practices within and between fields. Native grasses, legumes and forbs will be established in the field border to the extent needed to meet the resource needs and producer objectives. Minimum field border widths shall be based on NRCS local design criteria specific to the purpose for installing the practice. Native species shall be selected that do not function as a host for diseases of a field crop and have physical characteristics necessary to control wind and water erosion to tolerable levels on the field border area.

Feature Measure: acres planted

Scenario Unit: Acres

Scenario Typical Size: 0.10

Scenario Total Cost: $104.94

Scenario Cost/Unit: $1,049.36

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	0.1	$1.49
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	0.1	$0.67
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	3	$86.13
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$12.66	0.1	$1.27
Native and Introduced Perennial Grasses, Legumes and/or Forbs, Medium Density	2756	A mix of native and introduced perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to high density (41-60 pure live seeds/sq ft). Includes material and shipping.	Acres	$153.79	0.1	$15.38
Mobilization						
Mobilization, Pacific Island	2679	Mobilization cost of materials for sea or air freight services between islands.	Pound	$0.00	5	$0.00

Practice: 386 - Field Border

Scenario: #22 - Field Border, Native Species, Forgone Income

Scenario Description:
A strip of permanent vegetation established at the edge or around the perimeter of an agricultural field. Practice includes seedbed prep and planting of native species. The area of the field border is taken out of production.

Before Situation:
Before practice conditions may vary widely. Fields may have erosion issues from wind or water, a field border may be needed to manage pest populations, protect soil and water quality, provide wildlife food and cover, provide pollinator habitat, or a field border may be used to increase carbon storage and improve air quality. Water quality, soil erosion and/or wildlife food and cover may all be primary resource concerns.

After Situation:
The 386 Implementation Requirements have been developed and applied for the site. This practice when applied around a field may support and connect other buffer practices within and between fields. Native grasses, legumes and forbs will be established in the field borders to the extent needed to meet the resource needs and producer objectives. Minimum field border widths shall be based on NRCS local design criteria specific to the purpose for installing the practice. Native species shall be selected that do not function as a host for diseases of a field crop and have physical characteristics necessary to control wind and water erosion to tolerable levels on the field border area.

Feature Measure: number of acres

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $580.90

Scenario Cost/Unit: $580.90

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	3	$44.64
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	1	$22.27
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$415.54	0.5	$207.77
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$342.50	0.5	$171.25
Materials						
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$134.97	1	$134.97

Practice: 386 - Field Border

Scenario: #23 - Field Border, Introduced Species, Forgone Income

Scenario Description:
A strip of permanent vegetation established at the edge or around the perimeter of an agricultural field. Practice includes seedbed prep and planting of introduced species. The area of the field border is taken out of production.

Before Situation:
Before practice conditions may vary widely. Fields may have erosion issues from wind or water, a field border may be needed to manage pest populations, protect soil and water quality, provide wildlife food and cover, provide pollinator habitat, or a field border may be used to increase carbon storage and improve air quality. Water quality, soil erosion and/or wildlife food and cover may all be primary resource concerns.

After Situation:
The 386 Implementation Requirements have been developed and applied for the site. This practice when applied around a field may support and connect other buffer practices within and between fields. Introduced grasses and legumes will be established for the field border to the extent needed to meet the resource needs and producer objectives. Minimum field border widths shall be based on NRCS local design criteria specific to the purpose for installing the practice. Introduced species of grasses, legumes, forbs or shrubs shall be selected that are adapted to site, will not function as a host for diseases of a field crop and have physical characteristics necessary to control wind and water erosion to tolerable levels on the field border area.

Feature Measure: Number of acres

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $500.53

Scenario Cost/Unit: $500.53

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	1	$14.88
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	1	$22.27
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$415.54	0.5	$207.77
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$342.50	0.5	$171.25
Materials						
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	30	$20.40
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.81	20	$16.20
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$47.76	1	$47.76

Practice: 386 - Field Border

Scenario: #24 - Field Border, Pollinator, Forgone Income

Scenario Description:
A strip of permanent vegetation established at the edge or around the perimeter of an agricultural field. Practice includes seedbed prep and planting of pollinator friendly herbaceous species. The area of the field border is taken out of production.

Before Situation:
Before practice conditions may vary widely. Fields may have erosion issues from wind or water, a field border may be needed to manage pest populations, protect soil and water quality, provide wildlife food and cover, provide pollinator habitat, or a field border may be used to increase carbon storage and improve air quality. Water quality, soil erosion and/or wildlife food and cover may all be primary resource concerns.

After Situation:
The 386 Implementation Requirements have been developed and applied for the site. This practice when applied around a field may support and connect other buffer practices within and between fields. Pollinator herbaceous plantings will provide species which flower throughout the growing season. This provides a source of nectar for adult pollinators and a diversity of herbaceous material for immature pollinator life stages and for nesting. Minimum field border widths shall be based on NRCS local design criteria specific to the purpose for installing the practice. Species selected shall meet the pollinator habitat requirements of the state and be adapted to site; not function as a host for diseases of a field crop and; have physical characteristics necessary to control wind and water erosion to tolerable levels on the field border area.

Feature Measure: Number of acres

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $915.74

Scenario Cost/Unit: $915.74

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	3	$44.64
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	1	$22.27
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$415.54	0.5	$207.77
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$342.50	0.5	$171.25
Materials						
Native Perennial Grasses, Legumes and/or Forb Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, moderate commercial availability	2619	Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed is moderately easy to purchase commercially. Includes materials and shipping.	Acres	$469.81	1	$469.81

Practice: 386 - Field Border

Scenario: #53 - CB/VI - Field Border

Scenario Description:
A strip of permanent vegetation established at the edge or around the perimeter of an agricultural field. Practice includes seedbed prep and planting of native species. The area of the field border is taken out of production.

Before Situation:
Before practice conditions may vary widely. Fields may have erosion issues from wind or water, a field border may be needed to manage pest populations, protect soil and water quality, provide wildlife food and cover, provide pollinator habitat, or a field border may be used to increase carbon storage and improve air quality. Water quality, soil erosion and/or wildlife food and cover may all be primary resource concerns.

After Situation:
The 386 Implementation Requirements have been developed and applied for the site. This practice when applied around a field may support and connect other buffer practices within and between fields. Native grasses, legumes and forbs will be established in the field border to the extent needed to meet the resource needs and producer objectives. Minimum field border widths shall be based on NRCS local design criteria specific to the purpose for installing the practice. Native species shall be selected that do not function as a host for diseases of a field crop and have physical characteristics necessary to control wind and water erosion to tolerable levels on the field border area.

Feature Measure: Acres planted

Scenario Unit: Acres

Scenario Typical Size: 0.10

Scenario Total Cost: $104.94

Scenario Cost/Unit: $1,049.36

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	0.1	$1.49
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	0.1	$0.67
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	3	$86.13
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$12.66	0.1	$1.27
Native and Introduced Perennial Grasses, Legumes and/or Forbs, Medium Density	2756	A mix of native and introduced perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to high density (41-60 pure live seeds/sq ft). Includes material and shipping.	Acres	$153.79	0.1	$15.38
Mobilization						
Mobilization, Pacific Island	2679	Mobilization cost of materials for sea or air freight services between islands.	Pound	$0.00	5	$0.00

Practice: 386 - Field Border

Scenario: #71 - Small Scale Field Border

Scenario Description:
A strip of permanent vegetation established at the edge or around the perimeter of an agricultural field. Practice includes seedbed prep and planting of introduced plant species.

Before Situation:
Before practice conditions may vary based on farm size and location. Fields may have erosion by wind or water. Site provides little wildlife food or cover or pollinator habitat. Site soil organic matter is depleting. Particulate matter as dust is generated by field activity.

After Situation:
The 386 Implementation Requirements have been developed and applied for the site. Field border widths are based on NRCS local design criteria specific to the purpose for installing the practices. Species selected shall be adapted to site and not host disease or pests of the adjacent field crop. Species have physical characteristics necessary to control wind and water erosion to tolerable levels on the field border area.

Feature Measure: planted area

Scenario Unit: 1,000 Square Foot

Scenario Typical Size: 2.00

Scenario Total Cost: $165.08

Scenario Cost/Unit: $82.54

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	0.05	$0.74
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	0.05	$1.11
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	5	$143.55
Materials						
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	10	$6.80
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.81	10	$8.10
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$47.76	0.1	$4.78

Practice: 388 - Irrigation Field Ditch

Scenario: #15 - Irrigation Field Ditch

Scenario Description:
This scenario is the construction of an Irrigation Field Ditch. Typical construction dimensions are 2' wide bottom x 2' deep x 1320' length with a side slope of 2:1.

Resource concerns: Excess/Insufficient Water - Inefficient Use of Irrigation Water Associated Conservation Practices: 320-Irrigation Canal or Lateral; 443-Irrigation System, Surface or Subsurface Water; 533-Pumping Plant; 430-Irrigation Pipeline.

Before Situation:
Water supply for an area is inadequate for crop production and irrigation water application is inefficient.

After Situation:
An earthen canal that has adequate capacity to convey sufficient irrigation water to meet the demands of the system and make irrigation practical for the crops being grown.

Feature Measure: Volume of earth excavated

Scenario Unit: Cubic Yards

Scenario Typical Size: 587.00

Scenario Total Cost: $2,087.12

Scenario Cost/Unit: $3.56

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	587	$1,479.24
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	2	$607.88

Practice: 390 - Riparian Herbaceous Cover

Scenario: #5 - Warm Season Mix

Scenario Description:

Warm Season Grasses with Forbs: This scenario addresses inadequate herbaceous plant community function or diversity within the specific transitional zone between terrestrial and aquatic habitats in rangeland, pasture, cropland, and forest where natural seeding methods and/or management is unlikely to improve the plant community within a reasonable time period. This scenario applies to work not covered under NRCS Conservation Practice Range Planting (528), Forage and Biomass Planting (512), Critical Area Planting (342), Filter Strip (393), Restoration and Management of Rare and Declining Habitats (643), Streambank and Shoreline Protection (580), Vegetated Treatment Area (635), Wetland Enhancement (659), or Wetland Restoration (657). This practice can be used nation wide. The typical setting for this scenario is usually a narrow strip between the aquatic and terrestrial habitats subject to intermittant flooding and saturated soils where the exising plant community has been disturbed, destroyed, or the species diversity is unable to provide proper function and/or adequate habitat. Where the establishment of a diverse riparian herbaceous plant community is desired, an adapted mix of primarily warm season grasses, legumes, and/or forbs tolerant to the site conditions will be planted by broadcast and/or no-till or range drill seeding methods as necessary to accomplish the intended purpose(s). Where chemical control of undesirable vegetation, including invasives, is required to reduce competition for the desired plant community the Herbaceous Weed Control (315) practice should be used. Seedbed preparation may require LIGHT TILLAGE (disking). WHEN POLLINATOR HABITAT IS A CONSIDERATION: Include 5-10 adapted forb species that bloom sequentially throughout the growing season where feasible. To address the high diversity of riparian plant communities and their adjacent stream types that exist from the tropics to the tundra, and the deserts, prairies, mountains, and lowlands across the various regions and/or MLRA's, up to 20 adapted riparian plant community-specific scenarios may be required

Before Situation:

The riparian zone, the specific area between terrestrial and aquatic habitats, is currently an undesirable or inadequate stand of perennial or annual vegetation and natural reseeding or vegetation management is unlikely to improve the plant community within a reasonable amount of time to adequately address streambank and/or shoreline stability, dissipate stream energy and trap sediment, improve and/or maintain water quality, and/or provide adequate habitat corridors, food and/or cover for fish, wildlife, pollinators, and/or livestock resource conern(s). Existing conditions include erosion and the existing conditions often require suppression or eradication of current vegetation by conventional mechanical or chemical (Herbaceous Weed Control (315)) methods to ensure establishment success of the new planting.

After Situation:

The riparian zone, the transitional zone between the terrestrial and aquatic habitats, is established to an adapted, diverse vegetative plant community and is under close management to insure long term survival and ecological succession. The quality and quantity of the riparian zone components are managed to support the species that depend on it for habitat as well as the functions it performs for stabilizing the streambank and/or shoreline, dissipating stream energy and trapping sediment, and improving and/or maintaining water quality. These functions include: stream temperature moderation through shading, recruitment of non-woody organic matter, habitat for terrestrial insects and other riparian dependent species, streambank integrity, and filtration of contaminants from surface run-off into the stream.

Feature Measure: Acres of Riparian Herbaceous Cover

Scenario Unit: Acres

Scenario Typical Size: 0.50

Scenario Total Cost: $425.36

Scenario Cost/Unit: $850.72

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	1	$14.88
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	0.5	$11.14
Materials						
Native Perennial Grasses, Legumes and/or Forbs, Low Density	2753	A mix of native perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Species typically easy to purchase. Includes material and shipping.	Acres	$190.81	0.5	$95.41
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 390 - Riparian Herbaceous Cover

Scenario: #6 - Cool Season Mix

Scenario Description:

Cool Season Grasses with Forbs: This scenario addresses inadequate herbaceous plant community function or diversity within the specific transitional zone between terrestrial and aquatic habitats in rangeland, pasture, cropland, and forest where natural seeding methods and/or management is unlikely to improve the plant community within a reasonable time period. This scenario applies to work not covered under NRCS Conservation Practice Range Planting (528), Forage and Biomass Planting (512), Critical Area Planting (342), Filter Strip (393), Restoration and Management of Rare and Declining Habitats (643), Streambank and Shoreline Protection (580), Vegetated Treatment Area (635), Wetland Enhancement (659), or Wetland Restoration (657). This practice can be used nation wide. The typical setting for this scenario is usually a narrow strip between the aquatic and terrestrial habitats subject to intermittent flooding and saturated soils where the existing plant community has been disturbed, destroyed, or the species diversity is unable to provide proper function and/or adequate habitat. Where the establishment of a diverse riparian herbaceous plant community is desired, an adapted mix of primarily cool season grasses, legumes, and/or forbs tolerant to the site conditions will be planted by broadcast and/or no-till or range drill seeding methods as necessary to accomplish the intended purpose(s). Where chemical control of undesirable vegetation, including invasives, is required to reduce competition for the desired plant community the Herbaceous Weed Control (315) practice should be used. Seedbed preparation may require LIGHT TILLAGE (disking). WHEN POLLINATOR HABITAT IS A CONSIDERATION: Include 5-10 adapted forb species that bloom sequentially throughout the growing season where feasible. To address the high diversity of riparian plant communities and their adjacent stream types that exist from the tropics to the tundra, and the deserts, prairies, mountains, and lowlands across the various regions and/or MLRA's, up to 20 adapted riparian plant community-specific scenarios may be required

Before Situation:

The riparian zone, the specific area between terrestrial and aquatic habitats, is currently an undesirable or inadequate stand of perennial or annual vegetation and natural reseeding or vegetation management is unlikely to improve the plant community within a reasonable amount of time to adequately address streambank and/or shoreline stability, dissipate stream energy and trap sediment, improve and/or maintain water quality, and/or provide adequate habitat corridors, food and/or cover for fish, wildlife, pollinators, and/or livestock resource concern(s). Existing conditions include erosion and the existing conditions often require suppression or eradication of current vegetation by conventional mechanical or chemical (Herbaceous Weed Control (315)) methods to ensure establishment success of the new planting.

After Situation:

The riparian zone, the transitional zone between the terrestrial and aquatic habitats, is established to an adapted, diverse vegetative plant community and is under close management to insure long term survival and ecological succession. The quality and quantity of the riparian zone components are managed to support the species that depend on it for habitat as well as the functions it performs for stabilizing the streambank and/or shoreline, dissipating stream energy and trapping sediment, and improving and/or maintaining water quality. These functions include: stream temperature moderation through shading, recruitment of non-woody organic matter, habitat for terrestrial insects and other riparian dependent species, streambank integrity, and filtration of contaminants from surface run-off into the stream.

Feature Measure: Acres of Riparian Herbaceous Cover

Scenario Unit: Acres

Scenario Typical Size: 0.50

Scenario Total Cost: $393.32

Scenario Cost/Unit: $786.63

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	1	$14.88
Seeding Operation, Broadcast, Ground	959	Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs.	Acres	$14.02	0.5	$7.01
Materials						
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$134.97	0.5	$67.49
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 390 - Riparian Herbaceous Cover

Scenario: #41 - Native Species, Pollinator Planting

Scenario Description:

Native Species: This scenario addresses inadequate herbaceous plant community function or diversity within the specific transitional zone between terrestrial and aquatic habitats in rangeland, pasture, cropland, and forest where natural seeding methods and/or management is unlikely to improve the plant community within a reasonable time period. This scenario applies to work not covered under NRCS Conservation Practice Range Planting (550), Forage and Biomass Planting (512), Critical Area Planting (342), Filter Strip (393), Restoration and Management of Rare and Declining Habitats (643), Streambank and Shoreline Protection (580), Vegetated Treatment Area (635), Wetland Enhancement (659), or Wetland Restoration (657). The typical setting for this scenario is usually a narrow strip between the aquatic and terrestrial habitats subject to intermittent flooding and saturated soils where the existing plant community has been disturbed, destroyed, or the species diversity is unable to provide proper function and/or adequate habitat. Where the establishment of a diverse riparian herbaceous plant community is desired, an adapted mix of native grasses, legumes, and/or forbs tolerant to the site conditions will be planted by broadcast and/or no-till or range drill seeding methods as necessary to accomplish the intended purpose(s). Where chemical control of undesirable vegetation, including invasives, is required to reduce competition for the desired plant community, the Herbaceous Weed Control (315) practice should be used. Seedbed preparation may require LIGHT TILLAGE (disking). WHEN POLLINATOR HABITAT IS A CONSIDERATION: Include 5-10 adapted forb species that bloom sequentially throughout the growing season where feasible.

Before Situation:

The riparian zone, the specific area between terrestrial and aquatic habitats, is currently an undesirable or inadequate stand of perennial or annual vegetation and natural reseeding or vegetation management is unlikely to improve the plant community within a reasonable amount of time to adequately address streambank and/or shoreline stability, dissipate stream energy and trap sediment, improve and/or maintain water quality, and/or provide adequate habitat corridors, food and/or cover for fish, wildlife, pollinators, and/or livestock resource concern(s). Existing conditions often require suppression or eradication of current vegetation by conventional mechanical or chemical (Herbaceous Weed Control (315)) methods to ensure establishment success of the new planting. Soil quality may be reduced due to compaction and may require light tillage to prepare a proper seedbed.

After Situation:

The riparian zone, the transitional zone between the terrestrial and aquatic habitats, is established to an adapted, diverse vegetative plant community and is under close management to ensure long term survival and ecological succession. The quality and quantity of the riparian zone components are managed to support the species that depend on it for habitat as well as the functions it performs for stabilizing the streambank and/or shoreline, dissipating stream energy and trapping sediment, and improving and/or maintaining water quality. These functions include: stream temperature moderation through shading, recruitment of non-woody organic matter, habitat for terrestrial insects and other riparian dependent species, streambank integrity, and filtration of contaminants from surface run-off into the stream.

Feature Measure: Acres of Riparian Herbaceous Cover

Scenario Unit: Acres

Scenario Typical Size: 5.00

Scenario Total Cost: $1,182.79

Scenario Cost/Unit: $236.56

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	5	$74.40
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	5	$111.35
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	2	$57.42
Materials						
Native Perennial Grasses, Legumes and/or Forb Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, moderate commercial availability	2619	Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed is moderately easy to purchase commercially. Includes materials and shipping.	Acres	$469.81	2	$939.62

Practice: 390 - Riparian Herbaceous Cover

Scenario: #42 - Native Species

Scenario Description:

Native Species: This scenario addresses inadequate herbaceous plant community function or diversity within the specific transitional zone between terrestrial and aquatic habitats in rangeland, pasture, cropland, and forest where natural seeding methods and/or management is unlikely to improve the plant community within a reasonable time period. This scenario applies to work not covered under NRCS Conservation Practice Range Planting (550), Forage and Biomass Planting (512), Critical Area Planting (342), Filter Strip (393), Restoration and Management of Rare and Declining Habitats (643), Streambank and Shoreline Protection (580), Vegetated Treatment Area (635), Wetland Enhancement (659), or Wetland Restoration (657). The typical setting for this scenario is usually a narrow strip between the aquatic and terrestrial habitats subject to intermittent flooding and saturated soils where the existing plant community has been disturbed, destroyed, or the species diversity is unable to provide proper function and/or adequate habitat. Where the establishment of a diverse riparian herbaceous plant community is desired, an adapted mix of native grasses, legumes, and/or forbs tolerant to the site conditions will be planted by broadcast and/or no-till or range drill seeding methods as necessary to accomplish the intended purpose(s). Where chemical control of undesirable vegetation, including invasives, is required to reduce competition for the desired plant community, the Herbaceous Weed Control (315) practice should be used. Seedbed preparation may require LIGHT TILLAGE (disking). WHEN POLLINATOR HABITAT IS A CONSIDERATION: Include 5-10 adapted forb species that bloom sequentially throughout the growing season where feasible.

Before Situation:

The riparian zone, the specific area between terrestrial and aquatic habitats, is currently an undesirable or inadequate stand of perennial or annual vegetation and natural reseeding or vegetation management is unlikely to improve the plant community within a reasonable amount of time to adequately address streambank and/or shoreline stability, dissipate stream energy and trap sediment, improve and/or maintain water quality, and/or provide adequate habitat corridors, food and/or cover for fish, wildlife, pollinators, and/or livestock resource concern(s). Existing conditions often require suppression or eradication of current vegetation by conventional mechanical or chemical (Herbaceous Weed Control (315)) methods to ensure establishment success of the new planting. Soil quality may be reduced due to compaction and may require light tillage to prepare a proper seedbed.

After Situation:

The riparian zone, the transitional zone between the terrestrial and aquatic habitats, is established to an adapted, diverse vegetative plant community and is under close management to ensure long term survival and ecological succession. The quality and quantity of the riparian zone components are managed to support the species that depend on it for habitat as well as the functions it performs for stabilizing the streambank and/or shoreline, dissipating stream energy and trapping sediment, and improving and/or maintaining water quality. These functions include: stream temperature moderation through shading, recruitment of non-woody organic matter, habitat for terrestrial insects and other riparian dependent species, streambank integrity, and filtration of contaminants from surface run-off into the stream.

Feature Measure: Acres of Riparian Herbaceous Cover

Scenario Unit: Acres

Scenario Typical Size: 5.00

Scenario Total Cost: $243.17

Scenario Cost/Unit: $48.63

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	5	$74.40
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	5	$111.35
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	2	$57.42

Practice: 390 - Riparian Herbaceous Cover

Scenario: #43 - Native Species, Pollinator Planting with forgone income

Scenario Description:

Native Species: This scenario addresses inadequate herbaceous plant community function or diversity within the specific transitional zone between terrestrial and aquatic habitats in rangeland, pasture, cropland, and forest where natural seeding methods and/or management is unlikely to improve the plant community within a reasonable time period. This scenario applies to work not covered under NRCS Conservation Practice Range Planting (550), Forage and Biomass Planting (512), Critical Area Planting (342), Filter Strip (393), Restoration and Management of Rare and Declining Habitats (643), Streambank and Shoreline Protection (580), Vegetated Treatment Area (635), Wetland Enhancement (659), or Wetland Restoration (657). The typical setting for this scenario is usually a narrow strip between the aquatic and terrestrial habitats subject to intermittent flooding and saturated soils where the existing plant community has been disturbed, destroyed, or the species diversity is unable to provide proper function and/or adequate habitat. Where the establishment of a diverse riparian herbaceous plant community is desired, an adapted mix of native grasses, legumes, and/or forbs tolerant to the site conditions will be planted by broadcast and/or no-till or range drill seeding methods as necessary to accomplish the intended purpose(s). Where chemical control of undesirable vegetation, including invasives, is required to reduce competition for the desired plant community, the Herbaceous Weed Control (315) practice should be used. Seedbed preparation may require LIGHT TILLAGE (disking). WHEN POLLINATOR HABITAT IS A CONSIDERATION: Include 5-10 adapted forb species that bloom sequentially throughout the growing season where feasible. All grazing will be deferred during plant establishment which will consist of a minimum of one year, and in many cases longer. Typically there is no haying, and the only clipping during establishment will be for removal of weeds.

Before Situation:

The riparian zone, the specific area between terrestrial and aquatic habitats, is currently an undesirable or inadequate stand of perennial or annual vegetation and natural reseeding or vegetation management is unlikely to improve the plant community within a reasonable amount of time to adequately address streambank and/or shoreline stability, dissipate stream energy and trap sediment, improve and/or maintain water quality, and/or provide adequate habitat corridors, food and/or cover for fish, wildlife, pollinators, and/or livestock resource concern(s). Existing conditions often require suppression or eradication of current vegetation by conventional mechanical or chemical (Herbaceous Weed Control (315)) methods to ensure establishment success of the new planting. Soil quality may be reduced due to compaction and may require light tillage to prepare a proper seedbed.

After Situation:

The riparian zone, the transitional zone between the terrestrial and aquatic habitats, is established to an adapted, diverse vegetative plant community and is under close management to ensure long term survival and ecological succession. The quality and quantity of the riparian zone components are managed to support the species that depend on it for habitat as well as the functions it performs for stabilizing the streambank and/or shoreline, dissipating stream energy and trapping sediment, and improving and/or maintaining water quality. These functions include: stream temperature moderation through shading, recruitment of non-woody organic matter, habitat for terrestrial insects and other riparian dependent species, streambank integrity, and filtration of contaminants from surface run-off into the stream. All grazing will be deferred during plant establishment which will consist of a minimum of one year, and in many cases longer. Typically there is no haying, and the only clipping during establishment will be for removal of weeds.

Feature Measure: Acres of Riparian Herbaceous Cover

Scenario Unit: Acres

Scenario Typical Size: 5.00

Scenario Total Cost: $3,305.98

Scenario Cost/Unit: $661.20

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	5	$74.40
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	5	$111.35
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$415.54	1.67	$693.95
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$342.50	1.67	$571.98
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acres	$272.50	1.66	$452.35
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	2	$57.42
Materials						
Native Perennial Grasses, Legumes and/or Forb Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, moderate commercial availability	2619	Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed is moderately easy to purchase commercially. Includes materials and shipping.	Acres	$469.81	2	$939.62

Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$134.97	3	$404.91

Practice: 390 - Riparian Herbaceous Cover

Scenario: #44 - Native Species with forgone income

Scenario Description:

Native Species: This scenario addresses inadequate herbaceous plant community function or diversity within the specific transitional zone between terrestrial and aquatic habitats in rangeland, pasture, cropland, and forest where natural seeding methods and/or management is unlikely to improve the plant community within a reasonable time period. This scenario applies to work not covered under NRCS Conservation Practice Range Planting (550), Forage and Biomass Planting (512), Critical Area Planting (342), Filter Strip (393), Restoration and Management of Rare and Declining Habitats (643), Streambank and Shoreline Protection (580), Vegetated Treatment Area (635), Wetland Enhancement (659), or Wetland Restoration (657). The typical setting for this scenario is a narrow strip between the aquatic and terrestrial habitats, subject to intermittent flooding and saturated soils, where the existing plant community has been disturbed, destroyed, or the species diversity is unable to provide proper function and/or adequate habitat. Where the establishment of a diverse riparian herbaceous plant community is desired, an adapted mix of native grasses, legumes, and/or forbs tolerant to the site conditions will be planted, by broadcast and/or no-till or range drill seeding methods as necessary, to accomplish the intended purpose(s). Where chemical control of undesirable vegetation, including invasives, is required to reduce competition for the desired plant community, the Herbaceous Weed Control (315) practice should be used. Seedbed preparation may require LIGHT TILLAGE (disking). WHEN POLLINATOR HABITAT IS A CONSIDERATION: Include 5-10 adapted forb species that bloom sequentially throughout the growing season where feasible. All grazing will be deferred during plant establishment which will consist of a minimum of one year, and in many cases longer. Typically there is no haying, and the only clipping during establishment will be for removal of weeds.

Before Situation:

The riparian zone, the specific area between terrestrial and aquatic habitats, is currently an undesirable or inadequate stand of perennial or annual vegetation and natural reseeding or vegetation management is unlikely to improve the plant community within a reasonable amount of time to adequately address streambank and/or shoreline stability, dissipate stream energy and trap sediment, improve and/or maintain water quality, and/or provide adequate habitat corridors, food and/or cover for fish, wildlife, pollinators, and/or livestock resource concern(s). Existing conditions often require suppression or eradication of current vegetation by conventional mechanical or chemical (Herbaceous Weed Control (315)) methods to ensure establishment success of the new planting. Soil quality may be reduced due to compaction and may require light tillage to prepare a proper seedbed.

After Situation:

The riparian zone, the transitional zone between the terrestrial and aquatic habitats, is established to an adapted, diverse vegetative plant community and is under close management to ensure long term survival and ecological succession. The quality and quantity of the riparian zone components are managed to support the species that depend on it for habitat as well as the functions it performs for stabilizing the streambank and/or shoreline, dissipating stream energy and trapping sediment, and improving and/or maintaining water quality. These functions include: stream temperature moderation through shading, recruitment of non-woody organic matter, habitat for terrestrial insects and other riparian dependent species, streambank integrity, and filtration of contaminants from surface run-off into the stream. All grazing will be deferred during plant establishment which will consist of a minimum of one year, and in many cases longer. Typically there is no haying, and the only clipping during establishment will be for removal of weeds.

Feature Measure: Acres of Riparian Herbaceous Cover

Scenario Unit: Acres

Scenario Typical Size: 5.00

Scenario Total Cost: $2,636.30

Scenario Cost/Unit: $527.26

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	5	$74.40
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	5	$111.35
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$415.54	1.67	$693.95
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$342.50	1.67	$571.98
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acres	$272.50	1.66	$452.35
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	2	$57.42
Materials						
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$134.97	5	$674.85

Practice: 390 - Riparian Herbaceous Cover

Scenario: #60 - Plugging and Seeding

Scenario Description:

Plugging: This scenario addresses inadequate herbaceous plant community function or diversity within the specific transitional zone between terrestrial and aquatic habitats in rangeland, pasture, cropland, and forest where natural seeding methods and/or management is unlikely to improve the plant community within a reasonable time period. This scenario applies to work not covered under NRCS Conservation Practice Range Planting (528), Forage and Biomass Planting (512), Critical Area Planting (342), Filter Strip (393), Restoration and Management of Rare and Declining Habitats (643), Streambank and Shoreline Protection (580), Vegetated Treatment Area (635), Wetland Enhancement (659), or Wetland Restoration (657). This practice can be used nation wide. The typical setting for this scenario is usually a narrow strip between the aquatic and terrestrial habitats subject to intermittant flooding and saturated soils where the exising plant community has been disturbed, destroyed, or the species diversity is unable to provide proper function and/or adequate habitat. Where the establishment of a diverse riparian herbaceous plant community is desired, an adapted mix of grasses, sedges, rushes, ferns, legumes, and/or forbs tolerant to the site conditions will be planted. Grasses such as prairie cordgrass (Spartina pectinata), sedges, rushes, and/or ferns will be planted using plugs. Additional site adapted species of grasses, legumes, and/or forbs may be added by broadcast and/or no-till or range drill seeding methods as necessary to accomplish the intended purpose(s). Where chemical control of undesirable vegetation, including invasives, is required to reduce competition for the desired plant community the Herbaceous Weed Control (315) practice should be used. Seedbed preparation may require LIGHT TILLAGE (disking). WHEN POLLINATOR HABITAT IS A CONSIDERATION: Include 5-10 adapted forb species that bloom sequentially throughout the growing season where feasible. To address the high diversity of riparian plant communities and their adjacent stream types that exist from the tropics to the tundra, and the deserts, prairies, mountains, and lowlands across the various regions and/or MLRA's, up to 20 adapted riparian plant community-specific scenarios may be required

Before Situation:

The riparian zone, the specific area between terrestrial and aquatic habitats, is currently an undesirable or inadequate stand of perennial or annual vegetation and natural reseeding or vegetation management is unlikely to improve the plant community within a reasonable amount of time to adequately address streambank and/or shoreline stability, dissipate stream energy and trap sediment, improve and/or maintain water quality, and/or provide adequate habitat corridors, food and/or cover for fish, wildlife, pollinators, and/or livestock resource conern(s). Existing conditions often require suppression or eradication of current vegetation by conventional mechanical or chemical (Herbaceous Weed Control (315)) methods to ensure establishment success of the new planting.

After Situation:

The riparian zone, the transitional zone between the terrestrial and aquatic habitats, is established to an adapted, diverse vegetative plant community and is under close management to insure long term survival and ecological succession. The quality and quantity of the riparian zone components are managed to support the species that depend on it for habitat as well as the functions it performs for stabilizing the streambank and/or shoreline, dissipating stream energy and trapping sediment, and improving and/or maintaining water quality. These functions include: stream temperature moderation through shading, recruitment of non-woody organic matter, habitat for terrestrial insects and other riparian dependent species, streambank integrity, and filtration of contaminants from surface run-off into the stream.

Feature Measure: Acres of Riparian Herbaceous Cover

Scenario Unit: Acres

Scenario Typical Size: 0.50

Scenario Total Cost: $2,004.39

Scenario Cost/Unit: $4,008.78

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	1	$14.88
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	1	$22.27
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$75.12	2	$150.24
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	40	$1,148.40
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	2	$60.72
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	2	$607.88

Practice: 391 - Riparian Forest Buffer

Scenario: #1 - Seeding

Scenario Description:

Establish a buffer of trees and/or shrubs to restore riparian plant communities, provide shade and reduce water temperatures to improve riparian and aquatic habitats. The buffer will be located adjacent to and up-gradient from a watercourse or water body extending a minimum of 35 feet wide. The planting will consist of trees or shrubs planted through direct seeding. Seeding rate will be approximately 3000 seed per acre. Native seed (acorns, nuts, etc.) from native tree species are broadcast-seeded and lightly tilled into the soil. Native seeds are purchased locally to produce trees known to be adapted to local conditions. Site preparation is completed prior to seeding using CPS 490-Tree/Shrub Site Preparation. Resource concerns are: Plant Structure and Composition; Plant Productivity and Health; Terrestrial Habitat for Wildlife and Invertebrates.

Before Situation:

In forested settings, the forest is degrading. Valuable trees are not present, or are not regenerating due to changes in the natural disturbance regime or past harvesting. Undesirable shade-tolerant tree species have regenerated and either dominate the site or compete with desirable species. In openland settings, current vegetative cover is undesirable and does not address resource concerns.

After Situation:

Seed from native tree species has been planted at prescribed rates. Plant condition and terrestrial wildlife habitat are improving.

Feature Measure: Area of planting

Scenario Unit: Acres

Scenario Typical Size: 10.00

Scenario Total Cost: $14,612.68

Scenario Cost/Unit: $1,461.27

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	10	$148.80
Seeding Operation, Broadcast, Ground	959	Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs.	Acres	$14.02	10	$140.20
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$415.54	3.33	$1,383.75
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$342.50	3.33	$1,140.53
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acres	$272.50	3.34	$910.15
Materials						
Trees and shrubs, seed	1871	Tree or shrub seed, e.g., acorns, to establish trees. Includes materials and shipping only.	Pound	$9.36	1000	$9,360.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 391 - Riparian Forest Buffer

Scenario: #2 - Cuttings

Scenario Description:

Establish a buffer of trees and/or shrubs to restore riparian plant communities, provide shade and reduce water temperatures to improve riparian and aquatic habitats. The buffer will be located adjacent to and up-gradient from a watercourse or water body extending a minimum of 35 feet wide. The planting will consist of tree and/or shrub poles and live stakes (whips) planted by hand. Materials will be from a nearby, off-site location. The ratio of whips to poles will be 5:1. The cuttings will be planted in a mosaic pattern while still dormant. Tree mesh will be placed on the large cuttings.

Before Situation:

Typical sites include former riparian forests and habitat used for forage, cropland, speculation property, or other nonforest condition which contains undesirable amounts or types of vegetation. Active bank erosion is depositing sediment, nutrients and organics in the riparian area. Water temperature is high due to lack of shade. Habitat is not desirable for wildlife.

After Situation:

A buffer of trees and shrubs provides down woody debris, shade, and desirable wildlife habitats.

Feature Measure: Area of planting

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $5,298.62

Scenario Cost/Unit: $5,298.62

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hours	$9.89	10	$98.90
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	10	$181.30
Tractor, agricultural, 30 HP	1501	Agricultural tractor with horsepower range of less than 50. Equipment and power unit costs. Labor not included.	Hours	$16.94	10	$169.40
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$12.51	10	$125.10
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$415.54	0.33	$137.13
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$342.50	0.33	$113.03
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acres	$272.50	0.34	$92.65
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	70	$2,009.70
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	10	$303.60
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	4	$445.80
Materials						
Tree & Shrub, Woody, Cuttings, Medium	1308	Woody cuttings, live stakes or whips typically 1/4 to 1 inch diameter and 24 to 48 inches long. Includes materials and shipping only.	Each	$2.01	250	$502.50
Tree & Shrub, Woody, Cuttings, Large	1309	Woody pole cuttings or posts 2 to 6 inches in diameter and 6 ft. long. Includes materials and shipping only.	Each	$11.13	50	$556.50
Tree shelter, mesh tree tube, 48 in.	1556	48 inch tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only.	Each	$1.54	50	$77.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 391 - Riparian Forest Buffer

Scenario: #3 - Bare Root, hand planted

Scenario Description:

Establish a buffer of trees and/or shrubs to restore riparian plant communities, provide shade and reduce water temperatures to improve riparian and aquatic habitats, create large woody debris, reduce sediment, organic materials, excessive nutrients and on-farm chemicals in surface and shallow ground water flow, reduce pesticide drift onto water bodies or courses, and increase carbon storage. The buffer will be located adjacent to and up-gradient from a watercourse or water body extending a minimum of 35 feet wide. The planting will consist of hand planted bare-root shrubs, evergreen, and deciduous trees. The area will be planted to trees and shrubs suitable for the site conditions. Tree shelters will be placed on the hardwoods and bud caps will be placed on conifers.

Before Situation:

Typical sites include former riparian forests and habitat used for forage, cropland, speculation property, or other nonforest condition which contains undesirable amounts or types of vegetation. Water temperature is high due to lack of shade. Habitat is not desirable for wildlife. Upland agricultural areas adjacent to riparian areas are impacting the riparian areas with excessive nutrients, chemicals, and sediment contamination with overland and shallow groundwater flows, and aerial pesticides are drifting in to the riparian areas.

After Situation:

A buffer of trees and shrubs provides down woody debris, shade, and desirable wildlife habitats.

Feature Measure: Area of planting

Scenario Unit: Acres

Scenario Typical Size: 3.00

Scenario Total Cost: $12,082.33

Scenario Cost/Unit: $4,027.44

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	16	$405.76
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	16	$290.08
Trailer, enclosed, small	1503	Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included.	Hours	$14.56	16	$232.96
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$12.51	16	$200.16
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$415.54	1	$415.54
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$342.50	1	$342.50
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acres	$272.50	1	$272.50
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	112	$3,215.52
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	16	$777.60
Materials						
Shrub, Seedling, Medium	1507	Bare root shrub seedling, 18 to 36 inches tall; includes tropical containerized seedlings 10 to 20 cubic inches. Includes materials and shipping only.	Each	$1.56	1210	$1,887.60
Tree, Hardwood, Seedling, Medium	1510	Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only.	Each	$1.74	194	$337.56
Tree, Conifer, Seedling, Small	1512	Containerized conifer seedlings, 4 or 6 cubic inches; or bare root conifer seedlings 1+0 (one-year old seedlings grown in their original seedbed). Includes materials and shipping only.	Each	$0.94	242	$227.48
Tree shelter, mesh tree tube, 48 in.	1556	48 inch tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only.	Each	$1.54	121	$186.34
Tree shelter, solid tube type, 4 in. x 36 in	1565	4 inch x 36 inch tree tube for protection from animal damage. Materials and shipping only.	Each	$3.90	97	$378.30

Tree shelter, solid tube type, 5 in. x 30 in.	1570	5 inch x 30 inch tree tube for protection from animal damage. Materials and shipping only.	Each	$3.21	605	$1,942.05
Stakes, wood, 1 in. x 1 in. x 36 in.	1577	1 in. x 1 in. x 36 in. wood stakes to fasten items in place. Includes materials only.	Each	$1.01	702	$709.02
Stakes, wood, 1 in. x 1 in. x 48 in.	1578	1 in. x 1 in. x 48 in. wood stakes to fasten items in place. Includes materials only.	Each	$2.16	121	$261.36

Practice: 391 - Riparian Forest Buffer

Scenario: #4 - Bare Root, machine planted

Scenario Description:

Establish a buffer of trees and/or shrubs to restore riparian plant communities, provide shade and reduce water temperatures to improve riparian and aquatic habitats, create large woody debris, reduce sediment, organic materials, excessive nutrients and on-farm chemicals in surface and shallow ground water flow, reduce pesticide drift onto water bodies or courses, and increase carbon storage. The buffer will be located adjacent to and up-gradient from a watercourse or water body extending a minimum of 35 feet wide. The planting will consist of machine planted bare-root shrubs, evergreen, and deciduous trees suitable for site conditions. Tree shelters will be placed on the hardwoods and bud caps on the evergreens.

Before Situation:

Typical sites include former riparian forests and habitat used for forage, cropland, speculation property, or other nonforest condition which contains undesirable amounts or types of vegetation. Water temperature is high due to lack of shade. Habitat is not desirable for wildlife. Upland agricultural areas adjacent to riparian areas are impacting the riparian areas with excessive nutrients, chemicals, and sediment contamination with overland and shallow groundwater flows, and aerial pesticides are drifting in to the riparian areas.

After Situation:

A buffer of trees and shrubs provides down woody debris, shade, and desirable wildlife habitats.

Feature Measure: Area of planting

Scenario Unit: Acres

Scenario Typical Size: 3.00

Scenario Total Cost: $9,068.35

Scenario Cost/Unit: $3,022.78

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$36.34	8	$290.72
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	8	$145.04
Mechanical tree planter	1600	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hours	$5.96	8	$47.68
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$415.54	1	$415.54
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$342.50	1	$342.50
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acres	$272.50	1	$272.50
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	24	$689.04
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	8	$242.88
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	8	$388.80
Materials						
Shrub, Seedling, Medium	1507	Bare root shrub seedling, 18 to 36 inches tall; includes tropical containerized seedlings 10 to 20 cubic inches. Includes materials and shipping only.	Each	$1.56	1210	$1,887.60
Tree, Hardwood, Seedling, Medium	1510	Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only.	Each	$1.74	194	$337.56
Tree, Conifer, Seedling, Small	1512	Containerized conifer seedlings, 4 or 6 cubic inches; or bare root conifer seedlings 1+0 (one-year old seedlings grown in their original seedbed). Includes materials and shipping only.	Each	$0.94	242	$227.48
Tree shelter, mesh tree tube, 48 in.	1556	48 inch tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only.	Each	$1.54	121	$186.34
Tree shelter, solid tube type, 4 in. x 36 in	1565	4 inch x 36 inch tree tube for protection from animal damage. Materials and shipping only.	Each	$3.90	97	$378.30
Tree shelter, solid tube type, 5 in. x 30 in.	1570	5 inch x 30 inch tree tube for protection from animal damage. Materials and shipping only.	Each	$3.21	605	$1,942.05

Stakes, wood, 1 in. x 1 in. x 36 in.	1577	1 in. x 1 in. x 36 in. wood stakes to fasten items in place. Includes materials only.	Each	$1.01	702	$709.02
Stakes, wood, 1 in. x 1 in. x 48 in.	1578	1 in. x 1 in. x 48 in. wood stakes to fasten items in place. Includes materials only.	Each	$2.16	121	$261.36
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 391 - Riparian Forest Buffer

Scenario: #5 - Small container, hand planted

Scenario Description:

Establish a buffer of trees and/or shrubs to restore riparian plant communities, provide shade and reduce water temperatures to improve riparian and aquatic habitats, create large woody debris, reduce sediment, organic materials, excessive nutrients and on-farm chemicals in surface and shallow ground water flow, reduce pesticide drift onto water bodies or courses, and increase carbon storage. The buffer will be located adjacent to and up-gradient from a watercourse or water body extending a minimum of 35 feet wide. The planting will consist of hand planted small containerized shrubs, evergreen, and deciduous trees. Planting for shrubs will be at 6' x 6' spacing immediately adjacent to the waterbody, conifer and deciduous tree spacing at 15' X 15'. Tree shelters wil be placed on all seedlings.

Before Situation:

Typical sites include former riparian forests and habitat used for forage, cropland, speculation property, or other nonforest condition which contains undesirable amounts or types of vegetation. Water temperature is high due to lack of shade. Habitat is not desirable for wildlife. Upland agricultural areas adjacent to riparian areas are impacting the riparian areas with excessive nutrients, chemicals, and sediment contamination with overland and shallow groundwater flows, and aerial pesticides are drifting in to the riparian areas.

After Situation:

A buffer of trees and shrubs provides down woody debris, shade, and desirable wildlife habitats.

Feature Measure: Area of planting

Scenario Unit: Acres

Scenario Typical Size: 3.00

Scenario Total Cost: $14,072.16

Scenario Cost/Unit: $4,690.72

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	16	$405.76
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	16	$290.08
Trailer, enclosed, small	1503	Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included.	Hours	$14.56	16	$232.96
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$12.51	16	$200.16
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$415.54	1	$415.54
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$342.50	1	$342.50
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acres	$272.50	1	$272.50
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	112	$3,215.52
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	16	$777.60
Materials						
Shrub, Potted, Small	1524	Potted shrub seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$7.79	300	$2,337.00
Tree, Hardwood, Potted, Small	1529	Potted hardwood seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$4.91	194	$952.54
Tree, Conifer, Potted, Small	1534	Potted conifer seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$5.08	242	$1,229.36
Tree shelter, mesh tree tube, 48 in.	1556	48 inch tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only.	Each	$1.54	242	$372.68
Tree shelter, solid tube type, 4 in. x 24 in.	1563	4 inch x 24 inch tree tube for protection from animal damage. Materials and shipping only.	Each	$2.52	300	$756.00
Tree shelter, solid tube type, 4 in. x 48 in.	1566	4 inch x 48 inch tree tube for protection from animal damage. Materials and shipping only.	Each	$5.29	194	$1,026.26
Stakes, wood, 1 in. x 1 in. x 48 in.	1578	1 in. x 1 in. x 48 in. wood stakes to fasten items in place. Includes materials only.	Each	$2.16	436	$941.76

Mobilization

Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 391 - Riparian Forest Buffer

Scenario: #36 - Container Trees and Shrubs 2 gallon and larger, Each

Scenario Description:

Establish a buffer of trees and shrubs into a suitably prepared site to restore riparian plant communities and associated benefits. The buffer will be located adjacent to and up-gradient from a watercourse or water body and extend the minimum required width. The planting will consist of hand planting containerized shrubs and trees at spacing recommended in a tree/shrub planting plan. Payment includes shrubs/trees, equipment and labor to plant, and foregone income for the land taken out of crop production to install the riparian buffer. Resource concerns include Soil Erosion - excessive bank erosion; Water Quality - excess sediment and organics in surface waters and elevated temperature; Degraded Plant Condition - inadequate structure and composition; and Inadequate Habitat for Fish and Wildlife - habitat degradation.Site preparation is implemented through associated practice 490 Tree/Shrub Site Preparation. Additional associated practices may include: 315 Herbaceous Weed Control, 660 Tree/Shrub Pruning, 484 Mulching

Before Situation:

Typical sites include former riparian forests and habitat used for forage, cropland, speculation property, or other non forest condition which contains undesirable amounts or types of vegetation. Active bank erosion is depositing sediment, nutrients and organics in the riparian area. Water temperature is high due to lack of shade. Habitat is not desirable for wildlife.

After Situation:

A buffer of trees and shrubs will be established along the riparian corridor which will provide stability, filtration, shade, and desirable habitat to address the resource concerns listed in the scenario description.

Feature Measure: Per Tree/Shrub Planted

Scenario Unit: Each

Scenario Typical Size: 100.00

Scenario Total Cost: $2,613.00

Scenario Cost/Unit: $26.13

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$12.51	8	$100.08
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$415.54	1	$415.54
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$342.50	1	$342.50
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	2	$97.20
Materials						
Tree, Hardwood, Potted, Medium	1532	Potted hardwood seedling, 2 gallons or larger. Includes materials and shipping only.	Each	$14.28	100	$1,428.00

Practice: 391 - Riparian Forest Buffer

Scenario: #37 - Container Trees and Shrubs, less than 2 gallon, Each

Scenario Description:

Establish a buffer of trees and shrubs into a suitably prepared site to restore riparian plant communities and associated benefits. The buffer will be located adjacent to and up-gradient from a watercourse or water body and extend the minimum required width. The planting will consist of hand planting containerized shrubs and trees at spacing recommended in a tree/shrub planting plan. Payment includes shrubs/trees, equipment and labor to plant, and foregone income for the land taken out of crop production to install the riparian buffer. Resource concerns include Soil Erosion - excessive bank erosion; Water Quality - excess sediment and organics in surface waters and elevated temperature; Degraded Plant Condition - inadequate structure and composition; and Inadequate Habitat for Fish and Wildlife - habitat degradation. Site preparation is implemented through associated practice 490 Tree/Shrub Site Preparation. Additional associated practices may include: 315 Herbaceous Weed Control, 660 Tree/Shrub Pruning, 484 Mulching

Before Situation:

Typical sites include former riparian forests and habitat used for forage, cropland, speculation property, or other non forest condition which contains undesirable amounts or types of vegetation. Active bank erosion is depositing sediment, nutrients and organics in the riparian area. Water temperature is high due to lack of shade. Habitat is not desirable for wildlife.

After Situation:

A buffer of trees and shrubs will be established along the riparian corridor which will provide stability, filtration, shade, and desirable habitat to address the resource concerns listed in the scenario description.

Feature Measure: Per Tree/Shrub Planted

Scenario Unit: Each

Scenario Typical Size: 100.00

Scenario Total Cost: $1,676.00

Scenario Cost/Unit: $16.76

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$12.51	8	$100.08
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$415.54	1	$415.54
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$342.50	1	$342.50
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	2	$97.20
Materials						
Tree, Hardwood, Potted, Small	1529	Potted hardwood seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$4.91	100	$491.00

Practice: 391 - Riparian Forest Buffer

Scenario: #38 - Bareroot shrubs, each

Scenario Description:
Establish a buffer of shrubs, in conjunction with planted or existing trees, into a suitably prepared site to restore riparian plant communities and associated benefits. The buffer will be located adjacent to and up-gradient from a watercourse or water body and extend the minimum required width. The planting will consist of machine planted bare-root shrubs at spacings recommended in a tree/shrub planting plan. Payment includes shrubs, equipment and labor to plant, and foregone income for the land taken out of crop production to install the riparian buffer. Resource concerns include Soil Erosion - excessive bank erosion; Water Quality - excess sediment and organics in surface waters and elevated temperature; Degraded Plant Condition - inadequate structure and composition; and Inadequate Habitat for Fish and Wildlife - habitat degradation. Site preparation is implemented through associated practice 490 Tree/Shrub Site Preparation. Additional associated practices may include: 315 Herbaceous Weed Control, 660 Tree/Shrub Pruning, 484 Mulching

Before Situation:
Typical sites include former riparian forests and habitat used for forage, cropland, speculation property, or other nonforest condition which contains undesirable amounts or types of vegetation. Active bank erosion is depositing sediment, nutrients and organics in the riparian area. Water temperature is high due to lack of shade. Habitat is not desirable for wildlife.

After Situation:
A buffer of trees and shrubs will be established along the riparian corridor which will provide stability, filtration, shade, and desirable habitat to address the resource concerns listed in the scenario description.

Feature Measure: Per Tree/Shrub Planted

Scenario Unit: Each

Scenario Typical Size: 1,210.00

Scenario Total Cost: $2,921.22

Scenario Cost/Unit: $2.41

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	2	$50.72
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$36.34	2	$72.68
Mechanical tree planter	1600	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hours	$5.96	2	$11.92
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$415.54	0.5	$207.77
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$342.50	0.5	$171.25
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	2	$57.42
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	2	$60.72
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	2	$97.20
Materials						
Shrub, Seedling, Medium	1507	Bare root shrub seedling, 18 to 36 inches tall; includes tropical containerized seedlings 10 to 20 cubic inches. Includes materials and shipping only.	Each	$1.56	1210	$1,887.60
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 391 - Riparian Forest Buffer

Scenario: #39 - Bareroot trees, each

Scenario Description:

Establish a buffer of trees into a suitably prepared site to restore riparian plant communities and associated benefits. The buffer will be located adjacent to and up-gradient from a watercourse or water body and extend the minimum required width. The planting will consist of machine planted bare-root trees at spacings recommended in a tree/shrub planting plan. Payment includes trees, equipment and labor to plant, and foregone income for the land taken out of crop production to install the riparian buffer. Site preparation is implemented through associated practice 490 Tree/Shrub Site Preparation. Resource concerns include Soil Erosion - excessive bank erosion; Water Quality - excess sediment and organics in surface waters and elevated temperature; Degraded Plant Condition - inadequate structure and composition; and Inadequate Habitat for Fish and Wildlife - habitat degradation. Additional associated practices may include: 315 Herbaceous Weed Control, 660 Tree/Shrub Pruning, 484 Mulching

Before Situation:

Typical sites include former riparian forests and habitat used for forage, cropland, speculation property, or other nonforest condition which contains undesirable amounts or types of vegetation. Active bank erosion is depositing sediment, nutrients and organics in the riparian area. Water temperature is high due to lack of shade. Habitat is not desirable for wildlife.

After Situation:

A buffer of trees and shrubs will be established along the riparian corridor which will provide stability, filtration, shade, and desirable habitat to address the resource concerns listed in the scenario description.

Feature Measure: Per Tree/Shrub Planted

Scenario Unit: Each

Scenario Typical Size: 2,180.00

Scenario Total Cost: $6,373.22

Scenario Cost/Unit: $2.92

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	2	$50.72
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$36.34	2	$72.68
Mechanical tree planter	1600	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hours	$5.96	2	$11.92
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$415.54	2.5	$1,038.85
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$342.50	2.5	$856.25
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	2	$87.74
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	2	$60.72
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	2	$97.20
Materials						
Tree, Hardwood, Seedling, Medium	1510	Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only.	Each	$1.74	2180	$3,793.20
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 393 - Filter Strip

Scenario: #5 - Filter Strip, Native species

Scenario Description:
A strip or area of herbaceous vegetation that removes contaminants from overland flow. Practice includes seedbed prep and planting of native species.

Before Situation:
Annual cropland, grazing land, or disturbed land (including forestland) allows for runoff of suspended solids, dissolved and/or associated contaminants into environmentally-sensitive areas such as wetlands, riparian zones, critical habitat and neighboring nonagricultural properties. Water Quality resource concerns are associated with this practice.

After Situation:
The 393 Implementation Requirements are developed for the site and applied. The planned filter strip will be established and maintained per the practice plan that will meet the criteria for the planned purpose(s). The vegetation will consist of native species. The filter strip will have adequate width to filter the planned pollutants. The practice includes seedbed preparation, seeding, and seed. Species selected shall be able to withstand partial burial by sediment and tolerant of herbicides used on contribution area while protecting environmentally-sensitive areas.

Feature Measure: number of acres

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $286.92

Scenario Cost/Unit: $286.92

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	3	$44.64
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	1	$22.27
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	1.5	$27.20
Materials						
Native Perennial Grasses, Medium Density	2751	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Includes material and shipping.	Acres	$192.81	1	$192.81

Practice: 393 - Filter Strip

Scenario: #6 - Filter Strip, Introduced species

Scenario Description:
A strip or area of herbaceous vegetation that removes contaminants from overland flow. Practice includes seedbed prep and planting of introduced species.

Before Situation:
Annual cropland, grazing land, or disturbed land (including forestland) allows for runoff of suspended solids, dissolved and/or associated contaminants into environmentally-sensitive areas such as wetlands, riparian zones, critical habitat and neighboring nonagricultural properties. Water Quality resource concerns are associated with this practice.

After Situation:
The 393 Implementation Requirements are developed for the site and applied. The planned filter strip will be established and maintained per the practice plan that will meet the criteria for the planned purpose(s). The vegetation will consist of introduced species. The filter strip will have adequate width to filter the planned pollutants. The practice includes seedbed preparation, seeding, and seed. Species selected shall be able to withstand partial burial by sediment and tolerant of herbicides used on contribution area while protecting environmentally-sensitive areas.

Feature Measure: Number of acres

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $227.02

Scenario Cost/Unit: $227.02

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	3	$44.64
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.61	1	$7.61
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	1	$22.27
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	1.5	$27.20
Materials						
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	30	$20.40
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.81	20	$16.20
Introduced Perennial Grasses, Legumes and/or Forbs, High Density	2749	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping.	Acres	$88.70	1	$88.70

Practice: 393 - Filter Strip

Scenario: #13 - Caribbean and Virgin Island Filter Strip - All Species

Scenario Description:
A strip or area of herbaceous vegetation that removes contaminants from overland flow. Practice includes seedbed prep and planting of introduced species.

Before Situation:
Annual cropland, grazing land, or disturbed land (including forestland) allows for runoff of suspended solids, dissolved and/or associated contaminants into environmentally-sensitive areas such as wetlands, riparian zones, critical habitat and neighboring nonagricultural properties. Water Quality resource concerns are associated with this practice.

After Situation:
The 393 Implementation Requirements are developed for the site and applied. The planned filter strip will be established and maintained per the practice plan that will meet the criteria for the planned purpose(s). The vegetation will consist of introduced species. The filter strip will have adequate width to filter the planned pollutants. The practice includes seedbed preparation, seeding, and operation and maintenance to maintain the vegetation and the function of the filter strip. Species selected shall be able to withstand partial burial by sediment and tolerant of herbicides used on contribution area while protecting environmentally-sensitive areas.

Feature Measure: acre planted

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $125.15

Scenario Cost/Unit: $125.15

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	1	$25.36
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	2	$29.76
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	1	$22.27
Materials						
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$47.76	1	$47.76

Practice: 393 - Filter Strip

Scenario: #18 - Filter Strip, Native species, Forgone Income

Scenario Description:
A strip or area of herbaceous vegetation that removes contaminants from overland flow. Practice includes seedbed prep and planting of native species. The area of the filter strip is taken out of production.

Before Situation:
Annual cropland, grazing land, or disturbed land (including forestland) allows for runoff of suspended solids, dissolved and/or associated contaminants into environmentally-sensitive areas such as wetlands, riparian zones, critical habitat and neighboring non-ag properties. Water Quality resource concerns are associated with this practice.

After Situation:
The 393 Implementation Requirements are developed for the site and applied. The planned filter strip will be established and maintained per the practice plan that will meet the criteria for the planned purpose(s). The vegetation will consist of native species. The filter strip will have adequate width to filter the planned pollutants. The practice includes seedbed preparation, seeding, and seed. Species selected shall be able to withstand partial burial by sediment and tolerant of herbicides used on the contribution area while protecting environmentally-sensitive areas. The area of the filter strip is taken out of production.

Feature Measure: number of acres

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $665.94

Scenario Cost/Unit: $665.94

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	3	$44.64
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	1	$22.27
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	1.5	$27.20
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$415.54	0.5	$207.77
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$342.50	0.5	$171.25
Materials						
Native Perennial Grasses, Medium Density	2751	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Includes material and shipping.	Acres	$192.81	1	$192.81

Practice: 393 - Filter Strip

Scenario: #19 - Filter Strip, Introduced species, Forgone Income

Scenario Description:
A strip or area of herbaceous vegetation that removes contaminants from overland flow. Practice includes seedbed prep and planting of introduced species. The area of the filter strip is taken out of production.

Before Situation:
Annual cropland, grazing land, or disturbed land (including forestland) allows for runoff of suspended solids, dissolved and/or associated contaminants into environmentally-sensitive areas such as wetlands, riparian zones, critical habitat and neighboring non-ag properties. Water Quality resource concerns are associated with this practice.

After Situation:
The 393 Implementation Requirements are developed for the site and applied. The planned filter strip will be established and maintained per the practice plan that will meet the criteria for the planned purpose(s). The vegetation will consist of introduced species. The filter strip will have adequate width to filter the planned pollutants. The practice includes seedbed preparation, seeding, and seed. Species selected shall be able to withstand partial burial by sediment and tolerant of herbicides used on contribution area while protecting environmentally-sensitive areas. The area of the filter strip is taken out of production.

Feature Measure: Number of acres

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $606.04

Scenario Cost/Unit: $606.04

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	3	$44.64
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.61	1	$7.61
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	1	$22.27
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	1.5	$27.20
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$415.54	0.5	$207.77
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$342.50	0.5	$171.25
Materials						
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	30	$20.40
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.81	20	$16.20
Introduced Perennial Grasses, Legumes and/or Forbs, High Density	2749	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping.	Acres	$88.70	1	$88.70

Practice: 393 - Filter Strip

Scenario: #41 - PIA - Filter Strip - All Species

Scenario Description:
A strip or area of herbaceous vegetation that removes contaminants from overland flow. Practice includes seedbed prep and planting of introduced species.

Before Situation:
Annual cropland, grazing land, or disturbed land (including forestland) allows for runoff of suspended solids, dissolved and/or associated contaminants into environmentally-sensitive areas such as wetlands, riparian zones, critical habitat and neighboring nonagricultural properties. Water Quality resource concerns are associated with this practice.

After Situation:
The 393 Implementation Requirements are developed for the site and applied. The planned filter strip will be established and maintained per the practice plan that will meet the criteria for the planned purpose(s). The vegetation will consist of introduced species. The filter strip will have adequate width to filter the planned pollutants. The practice includes seedbed preparation, seeding, and operation and maintenance to maintain the vegetation and the function of the filter strip. Species selected shall be able to withstand partial burial by sediment and tolerant of herbicides used on contribution area while protecting environmentally-sensitive areas.

Feature Measure: Acre planted

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $125.15

Scenario Cost/Unit: $125.15

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	1	$25.36
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	2	$29.76
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	1	$22.27
Materials						
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$47.76	1	$47.76

Practice: 394 - Firebreak

Scenario: #2 - Constructed, Medium equipment, flat to medium slopes

Scenario Description:
Use of medium equipment such as small dozers to blade, disk, plow, etc. to construct bare-soil firebreaks on slopes less than 15%. Generally, water control devices such as water bars are limited to 10 or less per 1,000 feet when properly planned and installed using the same equipment.

Before Situation:
Tract, field, or farm lacks adequate firebreaks to either reduce the spread of wildfires or contain a prescribed burn. Conditions such as topography, the presence of brush and trees, etc. make the use of typical farm equipment impractical.

After Situation:
The property is adequately protected from wildfire or can be safely prescribe burned and the potential for excessive erosion from the firebreak is negligible.

Feature Measure: Length of firebreak

Scenario Unit: Feet

Scenario Typical Size: 3,000.00

Scenario Total Cost: $2,245.85

Scenario Cost/Unit: $0.75

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	4	$313.20
Water Bars	1500	Installation of graded trail water controlling structures such as water bars, broad based dips for erosion control. Typical cross section is 1.5 feet high with 4:1 side slopes yielding about 0.33 CY/ft of length.	Feet	$3.10	325	$1,007.50
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	4	$160.52
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 394 - Firebreak

Scenario: #3 - Constructed, Medium equipment, steep slopes

Scenario Description:
Use of equipment such as small dozers to blade bare-soil firebreaks on slopes greater than 15%. Water control devices such as water bars placed at approximately 15 to 25 per 1,000 ft section of firebreak are necessary to control erosion. These will be installed with the same equipment.

Before Situation:
Tract, field, or farm lacks adequate firebreaks to either reduce the spread of wildfires or contain a prescribed burn. Conditions such as topography, the presence of brush and trees, etc. make the use of typical farm equipment impractical. As slopes increase, the potential for excessive erosion increases from soil disturbances. Therefore the installation of water control devices such as water bars will be important in protecting the resource base.

After Situation:
The property is adequately protected from wildfire or can be safely prescribe burned and the potential for excessive erosion from the firebreak is minimized.

Feature Measure: Length of firebreak

Scenario Unit: Feet

Scenario Typical Size: 1,000.00

Scenario Total Cost: $2,168.35

Scenario Cost/Unit: $2.17

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	4	$313.20
Water Bars	1500	Installation of graded trail water controlling structures such as water bars, broad based dips for erosion control. Typical cross section is 1.5 feet high with 4:1 side slopes yielding about 0.33 CY/ft of length.	Feet	$3.10	300	$930.00
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	4	$160.52
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 394 - Firebreak

Scenario: #4 - Vegetated permanent firebreak

Scenario Description:
Establishing a strip of permanent vegetation that will serve as a green firebreak. Scenario includes clearing the site, preparing the seedbed, seeding (typically cool season grasses and/or legumes), and applying needed soil amendments. Clearing will be achieved with the use of a bush hog or similar equipment. Seedbed preparation and vegetation establishment will be accomplished with farm equipment. Soil amendments will be applied according to local FOTG guidance. This scenario does not include follow-up maintenance operations such as weed control. mowing, etc.

Before Situation:
Tract, field, or farm lacks adequate firebreaks to either reduce the spread of wildfires or contain a prescribed burn.

After Situation:
The property is adequately protected from wildfire or can be safely prescribe burned. Wildlife habitat will also be enhanced and the potential for erosion from the firebreak is minimized.

Feature Measure: Length of firebreak

Scenario Unit: Feet

Scenario Typical Size: 3,000.00

Scenario Total Cost: $693.63

Scenario Cost/Unit: $0.23

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hours	$31.60	4	$126.40
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	2	$29.76
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acres	$22.61	4	$90.44
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.61	1	$7.61
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$9.23	1	$9.23
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	1	$22.27
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Materials						
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.81	70	$56.70
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	70	$47.60
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$26.18	1	$26.18
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$47.76	1	$47.76

Practice: 394 - Firebreak

Scenario: #5 - Constructed, Wide, bladed or disked firebreak

Scenario Description:
Installing a bare-ground firebreak with a width of 30' or more on gently to strongly sloping slopes with equipment such as a dozer with a heavy disk. Using smaller equipment, erosion control devices such as water bars will be installed at approximately 15 to 25 per 1,000 feet of firebreak length. Devices will have stable outlets.

Before Situation:
Tract, field, or farm lacks adequate firebreaks to either reduce the spread of wildfires or contain a prescribed burn. Wide firebreaks are needed due to topography, high wildfire risk or to their use as down-wind breaks for prescribed burns. Conditions such as topography, the presence of brush and trees, etc. make the use of typical farm equipment impractical. As slopes increase, the potential for excessive erosion increases from soil disturbances. Therefore the installation of water control devices such as water bars will be important in protecting the resource base.

After Situation:
The property is adequately protected from wildfire or can be safely prescribe burned and the potential for excessive erosion from the firebreak is minimized.

Feature Measure: Length of firebreak

Scenario Unit: Feet

Scenario Typical Size: 1,000.00

Scenario Total Cost: $4,656.27

Scenario Cost/Unit: $4.66

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	8	$626.40
Fire Plow	1306	Heavy wildland plow or disk used for installing firebreaks. Equipment costs only for plow, use with a dozer component. Labor not included.	Hours	$36.28	4	$145.12
Water Bars	1500	Installation of graded trail water controlling structures such as water bars, broad based dips for erosion control. Typical cross section is 1.5 feet high with 4:1 side slopes yielding about 0.33 CY/ft of length.	Feet	$3.10	800	$2,480.00
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	12	$481.56
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 394 - Firebreak

Scenario: #6 - Hand Construction, Steep Slopes

Scenario Description:
Use of hand labor to build bare-soil firebreaks on slopes greater than 30%. Water control devices such as water bars placed at approximately 15 to 25 per 1,000 ft section of firebreak may be necessary to control erosion. These will be installed with hand equipment.

Before Situation:
Tract, field, or farm lacks adequate firebreaks to either reduce the spread of wildfires or contain a prescribed burn. Conditions such as topography, the presence of brush and trees, etc. make the use of typical farm equipment impractical. As slopes increase, the potential for excessive erosion increases from soil disturbances. Therefore the installation of water control devices such as water bars may be important in protecting the resource base.

After Situation:
The property is adequately protected from wildfire or can be safely prescribe burned and the potential for excessive erosion from the firebreak is minimized.

Feature Measure: Length of Firebreak

Scenario Unit: Feet

Scenario Typical Size: 1,000.00

Scenario Total Cost: $1,755.84

Scenario Cost/Unit: $1.76

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	5	$31.50
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	10	$181.30
Water Bars	1500	Installation of graded trail water controlling structures such as water bars, broad based dips for erosion control. Typical cross section is 1.5 feet high with 4:1 side slopes yielding about 0.33 CY/ft of length.	Feet	$3.10	40	$124.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	16	$459.36
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	16	$777.60
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08

Practice: 394 - Firebreak

Scenario: #24 - Constructed - Light Equipment

Scenario Description:
Installation of a bare-ground firebreak of a minimum width of 15' around a 20 acre field/farm using farm equipment (2 passes). Generally water control devices such as water bars are not needed due either to the lack of steep terrain or the temporary nature of the firebreak. Resource concerns include Wildfire hazard from excessive biomass accumulation, Undesirable plant productivity and health, Inadequate plant structure and composition, and Habitat degradation.

Before Situation:
Tract, field, or farm lacks adequate firebreaks to either reduce the spread of wildfires or contain a prescribed burn. Installation will be accomplished by making two passes with the use of typical farm equipment such as tractors, plows, disks, or similar implements.

After Situation:
The property is adequately protected from wildfire or can be safely prescribe burned.

Feature Measure: Length of firebreak

Scenario Unit: 100 Foot

Scenario Typical Size: 40.00

Scenario Total Cost: $183.12

Scenario Cost/Unit: $4.58

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	2	$50.72
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	2	$29.76
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acres	$22.61	2	$45.22
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	2	$57.42

Practice: 395 - Stream Habitat Improvement and Management

Scenario: #1 - Riparian Zone Improvement, Forested

Scenario Description:

This scenario describes fish and wildlife habitat improvement and/or management actions focused on the community structure and function of forested riparian zone plant communities. The planned activity meets the 395 standard, and facilitating practice standards, especially Codes 390 and 391, utilized in combination to satisfy all requirements specific to habitats needed for the stream and riparian species for which the practice is being implemented. Implementation will improve instream and riparian habitat complexity, water quality, hiding and resting cover, and/or increased food availability for desired riparian and stream species. Because species and habitats differ dramatically within and across regions and/or MLRAs, up to 12 riparian plant community-specific scenarios may be required across the US.

Before Situation:

Riparian quality and quantity are at risk as determined by the NRCS Stream Visual Assessment Protocol score of less than 5 for those elements. The site does not have adequate food, cover, and/or connectivity for riparian wildlife, and contributes insufficient amounts of organic matter andor large woody material for stream species food and cover. The site's riparian vegetation is compromised by human activities and/or access of vehicles, people, and/or livestock is not controlled adequately to protect riparian functions and stream habitat quality. Nutrients are transported to surface waters through runoff or soil erosion or to ground water from leaching in quantities that degrade water quality and limit use of intended purposes. Soil quality may be reduced due to compaction. Riparian vegetation quality and/or quantity is compromised to the extent that the riparian area and floodplain are not functioning to provide necessary stream and riparian habitat components.

After Situation:

Revegetation/reforestation of the riparian zone is completed and the vegetation community is under close management to insure long-term survival and ecological succession of the plant community. The quality and quantity of the riparian zone components of the site are managed to support a diverse vegetation community suitable for the site, the species that depend on it for habitat, and the functions it performs or will eventually perform as the vegetation matures. These functions include: stream temperature moderation thru shading, recruitment of instream large wood and/or non-woody organic matter, riparian habitat for terrestrial insects and other riparian-dependent species, streambank integrity, and filtration of contaminants from surface run-off into the stream.

Feature Measure: acres

Scenario Unit: Acres

Scenario Typical Size: 2.00

Scenario Total Cost: $22,223.08

Scenario Cost/Unit: $11,111.54

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	16	$1,058.88
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	8	$626.40
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	160	$7,019.20
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	40	$1,148.40
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	24	$963.12
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	40	$1,944.00
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	40	$4,458.00
Materials						
Compost	265	A mixture of decaying organic matter, as from leaves and manure, used to improve soil structure and provide nutrients.	Ton	$52.20	1	$52.20
Tree & Shrub, Woody, Cuttings, Large	1309	Woody pole cuttings or posts 2 to 6 inches in diameter and 6 ft. long. Includes materials and shipping only.	Each	$11.13	200	$2,226.00
Tree, Hardwood, Seedling, Medium	1510	Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only.	Each	$1.74	200	$348.00
Tree shelter, wire mesh	1557	5 feet tall, Woven Wire mesh, 6x6 inch opening or smaller, 10 gauge wire (minimum) cage placed around seedling for animal protection. Materials only.	Each	$2.34	200	$468.00

Native Perennial Grasses, Legumes and/or Forbs, Low Density	2753	A mix of native perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Species typically easy to purchase. Includes material and shipping.	Acres	$190.81	2	$381.62
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 395 - Stream Habitat Improvement and Management

Scenario: #2 - Instream wood placement

Scenario Description:

This scenario involves placement of large wood (logs, root wads, log structures) into a stream channel in order to improve aquatic habitat that currently does not meet quality criteria for stream species habitat. A stream assessment (i.e. Stream Visual Assessment Protocol) should be conducted in order to document habitat components lacking for aquatic species (i.e. large wood, pools). A project design for wood placement will be based on assessment of the target stream reach characteristics and those of a suitable reference reach. These characteristics include channel geometry, channel slope, stream bottom substrate size and composition, and the geomorphic setting influencing the channel form, pattern and profile. Large wood and root wads placed into the stream will mimic genus, age, and size of mature trees found in intact, reference riparian areas in the MLRA where the project is located. Large wood/trees with rootwads intact should be placed in streams to create pool habitat according to NRCS engineering specifications and with close review & approval of a fish habitat biologist. Boulders placed to provide ballast shall only be used if the geomorphic setting and project design demand this component. The planned activity will meet the current 395 standard, and facilitating practice standards utilized, including timing of work windows required for protected aquatic and riparian species, and protecting/restoring vegetation and substrates of/to areas impacted by heavy equipment. Implementation will result in the improvement of instream habitat complexity, hiding and resting cover, and/or increased food availability for fish and other stream species. Payment for implementation is to defray the costs of project implementation. Monitoring records demonstrating implementation of this scenario will address resource concerns for stream species of concern are required.

Before Situation:

In this stream reach, habitat for fish, aquatic insects and/or other stream species is sub-optimal as determined by the NRCS Stream Visual Assessment Protocol score of less than 5 overall. The site does not have adequate food, cover, and perhaps habitat connectivity for desired species. Riparian vegetation quality and/or quantity may also be compromised to the extent that the riparian area and floodplain are not functioning to provide necessary stream and riparian habitat components, such as large wood.

After Situation:

Stream habitat within the project reach is improving as a result of placing logs, root wads, and/or wood structures in the channel and/or along the stream bank. Pool habitat in the reach is improved, and hiding cover, food availability and refuge habitat for all stream species is improving.

Feature Measure: Per Structure

Scenario Unit: Each

Scenario Typical Size: 20.00

Scenario Total Cost: $6,794.59

Scenario Cost/Unit: $339.73

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hours	$145.01	30	$4,350.30
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	30	$1,203.90
Materials						
Root Wad	2045	Tree stump buried into the streambank with the roots left exposed. Includes material only.	Ton	$7.93	40	$317.20
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 395 - Stream Habitat Improvement and Management

Scenario: #4 - Instream wood placement, average density

Scenario Description:

This scenario involves placement of large wood (logs, root wads, log structures) into a stream channel in order to improve aquatic habitat that currently does not meet quality criteria for stream species habitat. A stream assessment (i.e. Stream Visual Assessment Protocol) should be conducted in order to document habitat components lacking for aquatic species (i.e. large wood, pools). A project design for wood placement will be based on assessment of the target stream reach characteristics and those of a suitable reference reach. These characteristics include channel geometry, channel slope, stream bottom substrate size and composition, and the geomorphic setting influencing the channel form, pattern and profile. Large wood and root wads placed into the stream will mimic genus, age, and size of mature trees found in intact, reference riparian areas in the MLRA where the project is located. Large wood/trees with rootwads intact should be placed in streams to create pool habitat according to NRCS engineering specifications and with close review & approval of a fish habitat biologist. Boulders placed to provide ballast shall only be used if the geomorphic setting and project design demand this component. The planned activity will meet the current 395 standard, and facilitating practice standards utilized, including timing of work windows required for protected aquatic and riparian species, and protecting/restoring vegetation and substrates of/to areas impacted by heavy equipment. Implementation will result in the improvement of instream habitat complexity, hiding and resting cover, and/or increased food availability for fish and other stream species. Payment for implementation is to defray the costs of project implementation. Monitoring records demonstrating implementation of this scenario will address resource concerns for stream species of concern are required.

Before Situation:

In this stream reach, habitat for fish, aquatic insects and/or other stream species is sub-optimal as determined by the NRCS Stream Visual Assessment Protocol score of less than 5 overall. The site does not have adequate food, cover, and perhaps habitat connectivity for desired species. Riparian vegetation quality and/or quantity may also be compromised to the extent that the riparian area and floodplain are not functioning to provide necessary stream and riparian habitat components, such as large wood.

After Situation:

Stream habitat within this one thousand foot reach of stream, with five classic geomorphic riffles, runs, pools, and glides, is improved as a result of placing three sixty foot long log and root wad structures on the outside of three of the five meander bend pools. Five additional thirty foot long log structures are places in riffles, runs, or glides to provide additional resting cover and habitat for aquatic organisms in between meander bend pools. These riffle, run, or glide wood structures include four, thirty foot long three-log diflector structures anchored by four posts jettied into the stream bed and one thirty foot long six-log double deflector structure anchored by eight posts jetted in the stream bed. Planning and design of these structures are such that all wood will be anchored, width of the instream structure will not exceed 10% of the stream width or 25% of the stream width when the structure is directing flow away from a channel bank, and the structures are not closer than 100 feet . Pool habitat, both geomorphic and forced, in the reach is improved, and hiding cover, food availability and refuge habitat for all stream species is improved.

Feature Measure: 1000 foot stream reach 15 feet wid

Scenario Unit: Square Feet

Scenario Typical Size: 15,000.00

Scenario Total Cost: $15,280.76

Scenario Cost/Unit: $1.02

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hours	$145.01	36	$5,220.36
Truck, dump, 12 CY	1215	Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only.	Hours	$104.69	8	$837.52
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	72	$2,067.12
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	44	$1,765.72
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	16	$1,783.20
Materials						
Steel, rebar	1832	Steel rebar, grade 60. Materials only.	Pound	$0.74	200	$148.00
Log, un-anchored	2035	Price of log picked up at the Mill. Includes material only.	Ton	$176.38	11	$1,940.18
Root Wad	2045	Tree stump buried into the streambank with the roots left exposed. Includes material only.	Ton	$7.93	3	$23.79
Anchor, earthen, low disturbance, small	2217	Low disturbance, galvanized or aluminum alloy earthen anchors with holding power of 3,000 pounds or less in normal soil. Materials and shipping only.	Each	$23.82	24	$571.68

Mobilization

Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 395 - Stream Habitat Improvement and Management

Scenario: #5 - Instream rock placement, each

Scenario Description:

This scenario describes the implementation of a stream habitat improvement and management project that places individual boulders or boulder clusters, or rock structures in or adjacent to the stream channel as habitat components. A project design for boulder placement will be based on assessment of the target stream reach characteristics and those of a suitable reference reach. These characteristics include channel geometry, channel slope, stream bottom substrate size and composition, and the geomorphic setting influencing the channel form, pattern and profile. Large rocks/boulders placed in the stream channel will mimic geologic material sizes typically present in the watershed or observed in intact, reference stream reaches in the MLRA where the project is located. Boulders should be placed in streams to create pool habitat and hydraulic complexity according to NRCS engineering specifications and with close review & approval of a fish habitat biologis onsite during implementation of the project design. Spawning gravel placement should be placed to restore spawning area substrates potentially disturbed by rock placement. The planned activity will meet the current 395 standard, and facilitating practice standards utilized. Implementation will result in the improvement of instream habitat complexity, hiding and resting cover, spawning habitat, and/or increased food availability for fish and other stream species. Payment for implementation is to defray the costs of stream habitat assessment, and project implementation. Records demonstrating implementation of this scenario will address resource concerns for stream species of concern will be required.

Before Situation:

In this stream reach, habitat for fish, aquatic insects and other stream species is sub-optimal as determined by the NRCS Stream Visual Assessment Protocol score of less than 5 overall. The site does not have adequate food, cover, and perhaps habitat connectivity for desired species. Riparian vegetation quality and/or quantity may be also compromised to the extent that the riparian area and floodplain are not functioning to provide necessary stream and riparian habitat components, such as large wood, leaf matter, and shade.

After Situation:

Stream habitat within the project reach is improving as a result of placing boulders or constructing rock structures in the channel and/or along the stream bank. Hydraulic complexity of the habitat in the reach is increased, and hiding cover, food availability and refuge habitat for stream species is improving. Streambank vegetation is increasing and contributing to stability of the streambanks.

Feature Measure: Per Structure

Scenario Unit: Each

Scenario Typical Size: 20.00

Scenario Total Cost: $15,410.83

Scenario Cost/Unit: $770.54

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hours	$145.01	16	$2,320.16
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	16	$642.08
Materials						
Rock Riprap, graded, angular, material and shipping	1200	Graded Rock Riprap for all gradation ranges. Includes materials and local delivery within 20 miles of quarry. Placement costs are not included.	Ton	$37.44	160	$5,990.40
Boulder	1761	Rock boulders (approximately 5 ft dia. 6.67 Tons). Includes materials and delivery (up to 100 miles) only. Placement costs are not included.	Ton	$92.25	60	$5,535.00
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 395 - Stream Habitat Improvement and Management

Scenario: #6 - Instream rock placement, feet

Scenario Description:

This scenario describes the implementation of a stream habitat improvement and management project that places individual boulders or boulder clusters, or rock structures in or adjacent to the stream channel as habitat components. A project design for boulder placement will be based on assessment of the target stream reach characteristics and those of a suitable reference reach. These characteristics include channel geometry, channel slope, stream bottom substrate size and composition, and the geomorphic setting influencing the channel form, pattern and profile. Large rocks/boulders placed in the stream channel will mimic geologic material sizes typically present in the watershed or observed in intact, reference stream reaches in the MLRA where the project is located. Boulders should be placed in streams to create pool habitat and hydraulic complexity according to NRCS engineering specifications and with close review & approval of a fish habitat biologis onsite during implementation of the project design. Spawning gravel placement should be placed to restore spawning area substrates potentially disturbed by rock placement. The planned activity will meet the current 395 standard, and facilitating practice standards utilized. Implementation will result in the improvement of instream habitat complexity, hiding and resting cover, spawning habitat, and/or increased food availability for fish and other stream species. Payment for implementation is to defray the costs of stream habitat assessment, and project implementation. Records demonstrating implementation of this scenario will address resource concerns for stream species of concern will be required.

Before Situation:

In this stream reach, habitat for fish, aquatic insects and other stream species is sub-optimal as determined by the NRCS Stream Visual Assessment Protocol score of less than 5 overall. The site does not have adequate food, cover, and perhaps habitat connectivity for desired species. Riparian vegetation quality and/or quantity may be also compromised to the extent that the riparian area and floodplain are not functioning to provide necessary stream and riparian habitat components, such as large wood, leaf matter, and shade.

After Situation:

Stream habitat within the project reach is improving as a result of placing boulders or constructing rock structures in the channel and/or along the stream bank. Hydraulic complexity of the habitat in the reach is increased, and hiding cover, food availability and refuge habitat for stream species is improving. Streambank vegetation is increasing and contributing to stability of the streambanks.

Feature Measure: 100 ft of stream reach

Scenario Unit: Feet

Scenario Typical Size: 100.00

Scenario Total Cost: $15,410.83

Scenario Cost/Unit: $154.11

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hours	$145.01	16	$2,320.16
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	16	$642.08
Materials						
Rock Riprap, graded, angular, material and shipping	1200	Graded Rock Riprap for all gradation ranges. Includes materials and local delivery within 20 miles of quarry. Placement costs are not included.	Ton	$37.44	160	$5,990.40
Boulder	1761	Rock boulders (approximately 5 ft dia. 6.67 Tons). Includes materials and delivery (up to 100 miles) only. Placement costs are not included.	Ton	$92.25	60	$5,535.00
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 395 - Stream Habitat Improvement and Management

Scenario: #9 - Lunker Structure

Scenario Description:

This scenario describes the implementation of a stream habitat improvement and management project that places individual lunker structures in the stream channel as habitat components. A project design will be based on assessment of the target stream reach characteristics and those of a suitable reference reach. These characteristics include channel geometry, channel slope, stream bottom substrate size and composition, and the geomorphic setting influencing the channel form, pattern and profile. Large rocks/boulders placed in the stream channel will mimic geologic material sizes typically present in the watershed or observed in intact, reference stream reaches in the MLRA where the project is located. Boulders should be placed in streams to create pool habitat and hydraulic complexity according to NRCS engineering specifications and with close review & approval of a fish habitat biologis onsite during implementation of the project design. Spawning gravel placement should be placed to restore spawning area substrates potentially disturbed by rock placement. The planned activity will meet the current 395 standard, and facilitating practice standards utilized. Implementation will result in the improvement of instream habitat complexity, hiding and resting cover, spawning habitat, and/or increased food availability for fish and other stream species. Payment for implementation is to defray the costs of stream habitat assessment, and project implementation. Records demonstrating implementation of this scenario will address resource concerns for stream species of concern will be required.

Before Situation:

In this stream reach, habitat for fish, aquatic insects and other stream species is sub-optimal as determined by the NRCS Stream Visual Assessment Protocol score of less than 5 overall. The site does not have adequate food, cover, and perhaps habitat connectivity for desired species. Riparian vegetation quality and/or quantity may be also compromised to the extent that the riparian area and floodplain are not functioning to provide necessary stream and riparian habitat components, such as large wood, leaf matter, and shade.

After Situation:

Stream habitat within the project reach is improving as a result of placing lunker structures in the channel and/or along the stream bank. Hydraulic complexity of the habitat in the reach is increased, and hiding cover, food availability and refuge habitat for stream species is improving. Streambank vegetation is increasing and contributing to stability of the streambanks.

Feature Measure: per structure

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $1,052.55

Scenario Cost/Unit: $1,052.55

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	0.33	$43.07
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	2	$57.42
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	0.33	$13.24
Materials						
Dimension Lumber, untreated	1045	Untreated dimension lumber with nominal thickness equal or less than 2 inches. Includes lumber and fasteners.	Board Feet	$2.10	50	$105.00
Rock Riprap, graded, angular, material and shipping	1200	Graded Rock Riprap for all gradation ranges. Includes materials and local delivery within 20 miles of quarry. Placement costs are not included.	Ton	$37.44	1.67	$62.52
Steel, rebar	1832	Steel rebar, grade 60. Materials only.	Pound	$0.74	9	$6.66
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 395 - Stream Habitat Improvement and Management

Scenario: #21 - Backwater Refuge

Scenario Description:

This scenario describes the implementation of a stream habitat improvement and management project that places backwater refuge habitat in connection with the stream channel habitat components. A project design will be based on assessment of the target stream reach characteristics and those of a suitable reference reach. The backwater refuge is usually related to accompanying instream habitat improvements being implemented with other instream habitat improvement scenarios. Backwater refuges placed adjacent to the stream will serve as important reptile, amphibian and invertebrate habitat which has been lost due to sedimentation since the advent of modern agriculture in the watershed. Typical backwater area is 10'x20'x3'deep.

Before Situation:

In this stream reach, habitat for fish, aquatic insects and other stream species is sub-optimal as determined by the NRCS Stream Visual Assessment Protocol score of less than 5 overall or state specific stream habitat evaluation tools. The site does not have adequate food, cover, and perhaps habitat connectivity for desired species. Riparian backwater areas quality and/or quantity has been compromised to the extent that the reptile, amphibian, and invertebrate habitat is no longer available to enhance the overall riparian area and floodplain ecosystem function.

After Situation:

Stream, riparian and floodplain habitat within the project reach is improving as a result of placing shallow backwater refuge structures adjacent to instream stream habitat improvement. Hydrologic complexity of the habitat in the reach is increased, and hiding cover, food availability and refuge habitat for stream and riparian species is improving.

Feature Measure: Per Refuge

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $1,105.91

Scenario Cost/Unit: $1,105.91

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	2	$261.02
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	2	$80.26
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 396 - Aquatic Organism Passage

Scenario: #1 - Earthen Dam Removal

Scenario Description:

Full removal of an earthen dam to restore aquatic organism passage, improve water quality, and promote functional river ecology and geomorphology. The removal extent is determined through consultations with the dam owner in consideration of prevailing regulations and site historical status. Adjacent floodplain surfaces above and below the target dam are considered in the planning process to account for shifts in streamflow and geomorphic regime. Resulting channel dimensions and profile are site-specific to reflect, to the fullest extent possible, pre-dam conditions. Pre-removal sediment assays are completed to determine the toxicity of sediment stored behind the dam. Planning for the reclamation and management of stored sediments is completed according to the sediment assays and results of the sediment toxicity investigation. Removal is done with an assortment of equipment, including tracked excavators outfitted with hydraulic chisels, hammers and/or buckets with 'thumbs', bull dozers, skid steers, cranes, front-end loaders, and dump trucks.Removed materials are trucked away and disposed or recycled off-site, unless native streambed material found in the embankment can be used in site reclamation. Disturbed areas are revegetated with a mix of site-adapted species. Scenario does not include additional measures needed in the active channel and floodplain to account for post-removal changes to stream plan, pattern, or profile, or reclamation of any former impounded areas. Additional structural measures may be necessary to address constructed features associated with the removed dam including head gates, canals, raceways, access and maintenance roads, or similar civil works. Contract revegetation work separately using 342 - Critical Area Planting. RESOURCE CONCERNS: INADEQUATE HABITAT FOR FISH AND WILDLIFE ???Habitat degradation; EXCESS WATER ??? Ponding, flooding, seasonal high water table, seeps, and drifted snow; WATER QUALITY DEGRADATION ??? Elevated water temperature. Additional conservation practices to address site preparation and reclamation in the project footprint: (570) Stormwater Runoff Control, (500) Obstruction Removal, (326) Clearing and Snagging, (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment ---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management, ---Structural Measures Associated practices outside of project footprint may include: (410) Grade Stabilization Structure, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection, (587) Structure for Water Control

Before Situation:

A channel-spanning earthen dam with a fill height of less than or equal to 8 feet no longer has functional use, may be failing, or creates a hazard to downstream capital infrastructure or communities. The dam blocks upstream aquatic organism migration, and downstream migrants may be diverted into hydraulic structures that increase mortality or result in migration delays or dead-ends. The dam disrupts the downstream cycling and transport of sediment, woody material and nutrients. The pool created by the dam may impair water quality by increasing temperatures, capturing fine sediment--sometimes laden with heavy metals or other pollutants--later mobilized by high flow events, and creating slackwater habitat for invasive aquatic vegetation. Non-native or exotic fish species inhabit the pool and predate upon and/or displace native fish.

After Situation:

The existing dam is removed, reach geometry and slope are restored to pre-dam conditions to the fullest extent practicable. Aquatic organism passage and river ecology and geomorphic conditions are restored to pre-dam conditions to the fullest extent practicable. Resource Concerns are addressed within the context of the project site. Typical scenario is the removal of a trapezoidal fill 8' top, 6' high, 38' base, 100 feet long and a pool area of 5acres with a maximum depth of 5 ft. with an average of 2.5ft in depth

Feature Measure: Cubic Yards of earthen embankmen

Scenario Unit: Cubic Yards

Scenario Typical Size: 500.00

Scenario Total Cost: $10,160.08

Scenario Cost/Unit: $20.32

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$100.26	7	$701.82
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hours	$145.01	9	$1,305.09
Water management, Flooding & dewatering	969	Includes equipment and power unit. Labor not included.	Acre Feet	$295.73	12.5	$3,696.63
Truck, dump, 12 CY	1215	Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only.	Hours	$104.69	12	$1,256.28
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	28	$1,123.64
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	8	$388.80
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 396 - Aquatic Organism Passage

Scenario: #3 - Blockage Removal

Scenario Description:

Removal of passage barriers, including small relict earthen diversions (e.g., splash dams), failing or undersized culverts, and sediment or large woody material (>4in diameter and 6.5 ft length) from mass wasting, major flood events, or beaver dams. Instream material associated with the previously mentioned circumstances or structures prevents aquatic organism passage by the creation of channel-spanning blockages, or areas of shallow depth, high velocities, or extensive changes in water surface elevation. In addition, these features may encourage abrupt channel changes that endanger adjacent capital infrastructure or transportation corridors. Excessive streambank erosion by flows deflected around or impounded behind these features may impair water quality by introducing fine sediment out of phase with the natural hydrograph and the life history requirements of native aquatic species. Spoil will be spread immediately adjacent to the project site in compliance with any permit requirements. Removal is done with an assortment of equipment, including tracked excavators outfitted with buckets with 'thumbs', bull dozers, skid steers, front-end loaders, and dump trucks. The channel and adjacent floodplain are restored to pre-blockage conditions to the fullest extent practicable. Removed materials are trucked away and disposed or recycled off-site, unless native streambed material found in the blockage can be used in site reclamation. Large woody material, if present, is used for instream reclamation, replaced in the channel downstream of the blockage, or trucked offsite for disposal or stockpiling for future projects. Disturbed areas are revegetated with a mix of site-adapted species. Scenario does not include additional measures needed in the active channel and floodplain. RESOURCE CONCERNS: INADEQUATE HABITAT FOR FISH AND WILDLIFE ???Habitat degradation; EXCESS WATER ??? Ponding, flooding, seasonal high water table, seeps, and drifted snow; WATER QUALITY DEGRADATION ??? Elevated water temperature; SOIL EROSION??? Excessive bank erosion from streams shorelines or water conveyance channels Contract associated practices separately to address site preparation and reclamation in the project footprint: (570) Stormwater Runoff Control (500) Obstruction Removal, (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment; (643) Restoration and Management of Rare and Declining Habitats. ---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management, ---Structural Measures Associated practices outside of project footprint may include: (410) Grade Stabilization Structure, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection

Before Situation:

An instream feature spanning the active channel creates hydraulic conditions that exceed the swimming or crawling abilities of native aquatic organisms. Event-driven mass wasting or instream deposits of coarse sediment create channel blockages or areas of shallow, fast-moving water. An instream plug of material transported to the site by flood flows or delivered to the channel from a hillslope failure not only blocks passage, but may deflect the stream toward a new course than endangers adjacent capital infrastructure or transportation corridors. Elevated risks associated with eventual over-topping or failure of the blockage to downstream features or communities are imminent in the event of a blockage that forms a temporary dam. Accelerated instream or lateral channel erosion may introduce fine sediment that impairs water quality.

After Situation:

The instream barrier is removed by a combination of methods and equipment and the channel and affected floodplain are restored to pre-blockage conditions to the fullest extent practicable. Resource Concerns are addressed within the context of the site.

Feature Measure: Each individual blockage removed

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $3,915.60

Scenario Cost/Unit: $3,915.60

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	10	$661.80
Truck, dump, 12 CY	1215	Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only.	Hours	$104.69	10	$1,046.90
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	10	$438.70
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	7	$200.97
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	20	$802.60
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 396 - Aquatic Organism Passage

Scenario: #5 - CMP Culvert, Less Than or Equal to 96 inch Diameter

Scenario Description:

A corrugated metal (galvanized steel or aluminum) pipe culvert (CMP) of any shape (round, elliptical, or squash) used at a road-stream crossing to provide aquatic organism passage (AOP) and promote stream ecological and geomorphic function. CMPs used for AOP are sized according to geomorphic analyses, not just an estimate of runoff and streamflow at the site from the contributing watershed. In addition, CMPs used for AOP are filled with a mixture of rock and gravel sized to emulate site stream conditions. The simulated streambed material is continuous throughout the culvert barrel, and blended with the intact streambed at the culvert inlet and outlet. The culvert size--diameter or span--is determined by analyzing bankfull channel width on a reach of stream not affected by an existing road crossing or other conditions that alter self-formed conditions. When replacing a culvert, bankfull investigations are typically conducted with 10- 20 estimated bankfull channel widths above the existing stream crossing or downstream if no suitable location can be found upstream. Culvert diameter or span is then selected according to channel bed composition and texture, bank characteristics, channel alignment at the crossing section, and other parameters that may affect channel dynamics and stability. Culvert length is determined by roadway geometry, loading requirements, and site stream conditions. Concrete headwalls and wingwalls are typical for this scenario to facilitate a shorter installation which is preferable to limit the structure footprint in the watercourse. CMPs are installed with an assortment of equipment used for excavation, placing material, and delivering and removing material. Stream dewatering and diversion around the work site is included. Channel bed material within the culvert barrel varies according to prevailing stream characteristics at the crossing site and design velocities if they vary from upstream and downstream natural velocities. The culvert is placed within the roadway on a sub-excavated compacted bed, set at a slope that matches the design longitudinal profile, and backfilled with a bed mixture that mimics adjacent stream characteristics with attention to channel pattern. Special equipment such as motorized wheelbarrows may be necessary to backfill smaller CMPs. The Structure is typically backfilled prior to installing the simulated streambed in the culvert barrel. The roadway is replaced and any necessary armoring material is placed at the culvert inlet and outlet where it intersects the road fill prism. This scenario does not include additional measures needed to address channel incision, bank stability, and other factors associated with the presence of the stream crossing.RESOURCE CONCERNS: INADEQUATE HABITAT FOR FISH AND WILDLIFE ???Habitat degradation; EXCESS WATER ??? Ponding, flooding, seasonal high water table, seeps, and drifted snow; WATER QUALITY DEGRADATION ??? Elevated water temperature; SOIL EROSION??? Excessive bank erosion from streams shorelines or water conveyance channels Contract associated practices separately to address site preparation and reclamation in the project footprint: (570) Stormwater Runoff Control, (500) Obstruction Removal, (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover,(391) Riparian Forest Buffer, (612) Tree/Shrub Establishment; ---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management, ---Structural Measures outside of project footprint may include: (410) Grade Stabilization Structure, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection

Before Situation:

An existing undersized culvert has contributed to general bed and bank scour downstream of a road crossing, and may have contributed to the deposition of a wedge of sediment upstream of the road crossing. The road may be overtopped by high flows, resulting in outright failure, landowner accessibility problems, access by and to emergency services, and hamper post-flood recovery efforts. An upstream impoundment created by the undersized culvert has contributed to water quality problems including high water temperatures and the deposition and later mobilization of polluted fine sediment. Native aquatic organisms are unable to pass through the road crossing because the culvert outlet is perched above the downstream pool, and high velocities are not negotiable by animals that are able to leap into the culvert barrel.

After Situation:

The undersized culvert is replaced with a CMP sized, placed, and backfilled with material determined by geomorphic analyses performed in a reference reach upstream of the crossing location. Geomorphic and ecological functions are preserved through the crossing site, enhancing AOP, water quality, and culvert longevity. In addition, because the culvert is sized to promote the transport of streamflow and the materials it carries, it requires decreased maintenance activities over time.Landowners are able to access their holdings across a range of flows, and are able to seek and receive emergency and post-flood recovery services. Resource Concerns are addressed within the context of the site. Typical scenario is an 8ft (96 inch) (50.3 square feet) diameter 12 ga. galvanized corrugated metal pipe, under a two-lane road 24 ft wide with two - 5 ft. shoulders = 34 feet (total length of culvert needed is 34 ft) with headwalls and wingwalls. Scenario unit is cubic feet using the CMP cross-sectional area: square feet x (Length of culvert under the road + total width of shoulders). Natural bed material is placed in the culvert to bankfull width. Typical scenario = 50.3 sq.ft. x (24ft + 10ft) = 1,710.2 cubic feet

Feature Measure: Cross-sectional area of culvert x (Le

Scenario Unit: Cubic Feet

Scenario Typical Size: 1,710.20

Scenario Total Cost: $92,160.17

Scenario Cost/Unit: $53.89

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	52	$29,488.16
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	360	$2,250.00
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hours	$145.01	32	$4,640.32
Water management, Flooding & dewatering	969	Includes equipment and power unit. Labor not included.	Acre Feet	$295.73	84	$24,841.32
Auger, Truck Mounted	2049	Truck mounted auger for large diameter excavation. Includes equipment and labor.	Hours	$113.27	2	$226.54
Labor						

General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	56	$1,607.76
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	32	$1,284.16
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement.	Cubic Yards	$136.88	12	$1,642.56
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	360	$10,389.60
Aggregate, gravel, washed, pea gravel	1331	Washed and graded pea gravel river stone. Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$32.50	8	$260.00
Pipe, CMP, 14-12 gauge, weight priced	1589	14 and 12 gauge galvanized helical corrugated metal pipe priced by the weight of the pipe materials. Materials only.	Pound	$0.93	4998	$4,648.14
Aggregate, river rock	1834	Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Ton	$25.51	14	$357.14
Sign, 3' x 2'	2259	.125 aluminum, single-sided, with nonreflective, EG reflective or HIP reflective face copy. Galvanized perforated square steel tube sign post with 2.5 x 30 inch non-perforated galvanized steel anchor, and Windbeam Bolt Assembly. Includes materials and shipping only.	Each	$223.56	2	$447.12
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	600	$600.00
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	2	$364.16
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19
Aggregate, Shipping, Cubic Yard-mile	2360	Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul).	Cubic Yard Mile	$0.42	19500	$8,190.00

Practice: 396 - Aquatic Organism Passage

Scenario: #6 - CMP Culvert, Greater Than 96 inch Diameter

Scenario Description:

A corrugated metal (galvanized steel or aluminum) pipe culvert (CMP) of any shape (round, elliptical, or squash) used at a road-stream crossing to provide aquatic organism passage (AOP) and promote stream ecological and geomorphic function. CMPs used for AOP are sized according to geomorphic analyses, not just an estimate of runoff and streamflow at the site from the contributing watershed. In addition, CMPs used for AOP are filled with a mixture of rock and gravel sized to emulate site stream conditions. The simulated streambed material is continuous throughout the culvert barrel, and blended with the intact streambed at the culvert inlet and outlet. The culvert size--diameter or span--is determined by analyzing bankfull channel width on a reach of stream not affected by an existing road crossing or other conditions that alter self-formed conditions. When replacing a culvert, bankfull investigations are typically conducted with 10- 20 estimated bankfull channel widths above the existing stream crossing or downstream if no suitable location can be found upstream. Culvert diameter or span is then selected according to channel bed composition and texture, bank characteristics, channel alignment at the crossing section, and other parameters that may affect channel dynamics and stability. Culvert length is determined by roadway geometry, loading requirements, and site stream conditions. Concrete headwalls and wingwalls are typical for this scenario to facilitate a shorter installation which is preferable to limit the structure footprint in the watercourse. CMPs are installed with an assortment of equipment used for excavation, placing material, and delivering and removing material. Stream dewatering and diversion around the work site is included. Channel bed material within the culvert barrel varies according to prevailing stream characteristics at the crossing site and design velocities if they vary from upstream and downstream natural velocities. The culvert is placed within the roadway on a sub-excavated compacted bed, set at a slope that matches the design longitudinal profile, and backfilled with a bed mixture that mimics adjacent stream characteristics with attention to channel pattern. Special equipment such as motorized wheelbarrows may be necessary to backfill smaller CMPs. The Structure is typically backfilled prior to installing the simulated streambed in the culvert barrel. The roadway is replaced and any necessary armoring material is placed at the culvert inlet and outlet where it intersects the road fill prism. This scenario does not include additional measures needed to address channel incision, bank stability, and other factors associated with the presence of the stream crossing.RESOURCE CONCERNS: INADEQUATE HABITAT FOR FISH AND WILDLIFE ???Habitat degradation; EXCESS WATER ??? Ponding, flooding, seasonal high water table, seeps, and drifted snow; WATER QUALITY DEGRADATION ??? Elevated water temperature; SOIL EROSION??? Excessive bank erosion from streams shorelines or water conveyance channels Contract associated practices separately to address site preparation and reclamation in the project footprint: (570) Stormwater Runoff Control, (500) Obstruction Removal, (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover,(391) Riparian Forest Buffer, (612) Tree/Shrub Establishment; ---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management, ---Structural Measures outside of project footprint may include: (410) Grade Stabilization Structure, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection

Before Situation:

An existing undersized culvert has contributed to general bed and bank scour downstream of a road crossing, and may have contributed to the deposition of a wedge of sediment upstream of the road crossing. The road may be overtopped by high flows, resulting in outright failure, landowner accessibility problems, access by and to emergency services, and hamper post-flood recovery efforts. An upstream impoundment created by the undersized culvert has contributed to water quality problems including high water temperatures and the deposition and later mobilization of polluted fine sediment. Native aquatic organisms are unable to pass through the road crossing because the culvert outlet is perched above the downstream pool, and high velocities are not negotiable by animals that are able to leap into the culvert barrel.

After Situation:

The undersized culvert is replaced with a CMP sized, placed, and backfilled with material determined by geomorphic analyses performed in a reference reach upstream of the crossing location. Geomorphic and ecological functions are preserved through the crossing site, enhancing AOP, water quality, and culvert longevity. In addition, because the culvert is sized to promote the transport of streamflow and the materials it carries, it requires decreased maintenance activities over time.Landowners are able to access their holdings across a range of flows, and are able to seek and receive emergency and post-flood recovery services. Resource Concerns are addressed within the context of the site. Typical scenario is a 10ft (120 inch) diameter (78.5 square feet) 12ga. galvanized metal pipe, under a two-lane road 24ft wide with two -5 ft shoulders with headwalls and wingwalls, total length of culvert needed is 34 ft. Scenario unit is cubic feet using the CMP cross sectional area; square feet x (Length of culvert under the road + total shoulder width). Natural bed material is placed in the culvert to bankfull width. Typical scenario = 78.5 sqft x (24' +10')= 2,669 cubic feet

Feature Measure: Cross-sectional area of culvert x (Le

Scenario Unit: Cubic Feet

Scenario Typical Size: 2,669.00

Scenario Total Cost: $121,247.19

Scenario Cost/Unit: $45.43

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	77	$43,665.16
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	523	$3,268.75
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hours	$145.01	32	$4,640.32
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$56.88	2	$113.76
Water management, Flooding & dewatering	969	Includes equipment and power unit. Labor not included.	Acre Feet	$295.73	84	$24,841.32
Auger, Truck Mounted	2049	Truck mounted auger for large diameter excavation. Includes equipment and labor.	Hours	$113.27	2	$226.54
Crane, truck mounted, hydraulic, 80 ton	2569	80 ton capacity truck mounted hydraulic crane. Equipment cost only.	Hours	$349.47	2	$698.94

Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	56	$1,607.76
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	2	$60.72
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	34	$1,364.42
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement.	Cubic Yards	$136.88	23	$3,148.24
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	523	$15,093.78
Aggregate, gravel, washed, pea gravel	1331	Washed and graded pea gravel river stone. Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$32.50	9.7	$315.25
Pipe, CMP, 14-12 gauge, weight priced	1589	14 and 12 gauge galvanized helical corrugated metal pipe priced by the weight of the pipe materials. Materials only.	Pound	$0.93	6222	$5,786.46
Aggregate, river rock	1834	Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Ton	$25.51	18	$459.18
Sign, 3' x 2'	2259	.125 aluminum, single-sided, with nonreflective, EG reflective or HIP reflective face copy. Galvanized perforated square steel tube sign post with 2.5 x 30 inch non-perforated galvanized steel anchor, and Windbeam Bolt Assembly. Includes materials and shipping only.	Each	$223.56	2	$447.12
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	600	$600.00
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	2	$364.16
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	2	$1,846.38
Aggregate, Shipping, Cubic Yard-mile	2360	Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul).	Cubic Yard Mile	$0.42	28415	$11,934.30

Practice: 396 - Aquatic Organism Passage

Scenario: #7 - Bottomless Culvert

Scenario Description:

A multi-plate galvanized steel or aluminum culvert (arch or box) used at a road-stream crossing and promote stream ecological and geomorphic function. They commonly attach to preformed reinforced or poured-in-place concrete footings. Due to state regulations bottomless culverts are typically filled with a mixture of rock and gravel sized to emulate site stream conditions. The simulated streambed material is continuous throughout the culvert, and blended with the intact streambed at the culvert inlet and outlet. Culvert span is selected according to channel bed composition and texture, bank characteristics, channel alignment at the crossing section, and other parameters that may affect channel dynamics and stability. Culvert length is determined by roadway geometry, loading requirements, and site stream conditions. Concrete headwalls and wingwalls are typical for this scenario to facilitate a shorter installation which is preferable to limit the structure footprint in the watercourse. Bottomless arch or box culverts are commonly delivered in sections and bolted together in the field. Smaller arches can be delivered in one piece. They are installed with an assortment of equipment used for excavation, placing material, and delivering and removing material. Stream dewatering and diversion around the work site is included. Footings are placed or poured, and the new streambed culvert is set at a slope that matches the design longitudinal profile, and backfilled with a bed mixture that mimics adjacent stream characteristics. Larger rock may be placed along the footing/culvert stemwall to protect the connection from damage by transported bedload movement and as bank material. The roadway is replaced and any necessary armoring material is placed at the culvert inlet and outlet where it intersects the road fill prism. This scenario does not include additional measures needed to address channel incision, bank stability, and other factors associated with the presence of the stream crossing. Scenario does not include concrete for head or wingwalls. RESOURCE CONCERNS: INADEQUATE HABITAT FOR FISH AND WILDLIFE ???Habitat degradation; EXCESS WATER ??? Ponding, flooding, seasonal high water table, seeps, and drifted snow; WATER QUALITY DEGRADATION ??? Elevated water temperature; SOIL EROSION??? Excessive bank erosion from streams shorelines or water conveyance channels. Contract associated practices separately to address site preparation and reclamation associated with project footprint: (570) Stormwater Runoff Control, (500) Obstruction Removal, (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment; ---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management, ---Structural Measures outside of project footprint may include: (410) Grade Stabilization Structure, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection

Before Situation:

An existing undersized culvert has contributed to general bed and bank scour downstream of a road crossing, and may have contributed to the deposition of a wedge of sediment upstream of the road crossing. The road may be overtopped by high flows, resulting in outright failure, landowner accessibility problems, access by and to emergency services, and hamper post-flood recovery efforts. An upstream impoundment created by the undersized culvert has contributed to water quality problems including high water temperatures and the deposition and later mobilization of polluted fine sediment. Native aquatic organisms are unable to pass through the road crossing because the culvert outlet is perched above the downstream pool, and high velocities are not negotiable by animals that are able to leap into the culvert barrel.

After Situation:

The undersized culvert is replaced with a bottomless arch or box culvert that is sized, placed, and backfilled with material determined by geomorphic analyses performed in a reference reach upstream of the crossing location. Geomorphic and ecological functions are preserved through the crossing site, enhancing AOP, water quality, and culvert longevity. In addition, because the culvert is sized to promote the transport of streamflow and the materials it carries, it requires decreased maintenance activities over time. Landowners are able to access their holdings across a range of flows, and are able to seek and receive emergency and post-flood recovery services. Resource Concerns are addressed within the context of the site. Typical scenario is the installation of a bottomless galvanized multi-plate arch structure (7ga.) set on precast concrete footings with headwalls and wingwalls. The typical size is 10' span x 5'-2' rise x 34' long, under a two-lane road 24ft wide with two - 5ft shoulders (Total length of culvert needed is 34 ft). Scenario unit is cubic feet using the culvert published cross-sectional area; square feet x (Length of culvert under the road + total shoulder width). Footings are protected from scour by rock riprap and natural channel bed under the culvert. Published cross-sectional area of bottomless culvert with 10ft span and 5ft-2inches rise = 41.2sq.ft. Typical scenario = 41.2sf x (24 ft +10ft) = 1,400.8 cubic feet

Feature Measure: Published cross-sect area x (Length

Scenario Unit: Cubic Feet

Scenario Typical Size: 1,400.80

Scenario Total Cost: $124,821.12

Scenario Cost/Unit: $89.11

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	39.5	$22,399.66
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.11	72	$79.92
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	300	$1,875.00
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hours	$145.01	32	$4,640.32
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$56.88	5	$284.40
Water management, Flooding & dewatering	969	Includes equipment and power unit. Labor not included.	Acre Feet	$295.73	118	$34,896.14
Auger, Truck Mounted	2049	Truck mounted auger for large diameter excavation. Includes equipment and labor.	Hours	$113.27	2	$226.54
Crane, truck mounted, hydraulic, 80 ton	2569	80 ton capacity truck mounted hydraulic crane. Equipment cost only.	Hours	$349.47	3	$1,048.41

Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	20	$877.40
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	64	$1,837.44
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	5	$151.80
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	35	$1,404.55
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	16	$777.60
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	115	$12,816.75
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement.	Cubic Yards	$136.88	31	$4,243.28
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	300	$8,658.00
Aggregate, river rock	1834	Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Ton	$25.51	18	$459.18
Footing, concrete, precast	1836	Precast spread footing with stemwall, T-shaped, with channel built to accept arched culvert leg. Includes materials only.	Feet	$85.47	68	$5,811.96
Geocell, 6 inch	1842	6-inch thick cellular confinement system, three-dimensional, expandable panels made from high-density polyethylene (HDPE), polyester or another polymer material. Includes materials, labor and equipment for the geocell only, does not include backfill.	Square Yard	$27.61	72	$1,987.92
Culvert, Multi-Plate arch	1979	Multi-plate arch culvert, typically 7 Gauge corrugated plate. Includes metal arch materials only, does not include footings.	Pound	$1.48	6052	$8,956.96
Sign, 3' x 2'	2259	.125 aluminum, single-sided, with nonreflective, EG reflective or HIP reflective face copy. Galvanized perforated square steel tube sign post with 2.5 x 30 inch non-perforated galvanized steel anchor, and Windbeam Bolt Assembly. Includes materials and shipping only.	Each	$223.56	2	$447.12
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	750	$750.00
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	2	$364.16
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	2	$1,846.38
Aggregate, Shipping, Cubic Yard-mile	2360	Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul).	Cubic Yard Mile	$0.42	17180	$7,215.60

Practice: 396 - Aquatic Organism Passage

Scenario: #9 - Concrete Box Culvert

Scenario Description:

A four-sided precast concrete box (square or rectangular) culvert used at a road-stream crossing to provide aquatic organism passage (AOP) and promote stream ecological and geomorphic function. Concrete box culverts are generally available in sections of 1-foot increments. Concrete box culverts are sized according to geomorphic analyses, not just an estimate of runoff and streamflow at the site from the contributing watershed. Due to state regulations concrete box culverts are typically filled with a mixture of rock and gravel sized to emulate site stream conditions and geomorphic units in the channel. The simulated streambed material is continuous throughout the culvert and blended with the intact streambed at the culvert inlet and outlet. The culvert width is determined by analyzing bankfull channel width on a reach of stream not affected by an existing road crossing or other conditions that alter self-formed conditions. When replacing a culvert, bankfull investigations are typically conducted with 10-20 estimated bankfull channel widths above the existing stream crossing or downstream if no suitable location can be found upstream. Culvert width is selected according to channel bed composition and texture, bank characteristics, channel alignment at the crossing section, and other parameters that may affect channel dynamics and stability. Culvert length is determined by roadway geometry, loading requirements, and site stream conditions. Concrete headwalls and wingwalls are typical for this scenario to facilitate a shorter installation which is preferable to limit the structure footprint in the watercourse. Concrete box culverts are delivered in sections and assembled onsite, and require adequate bed compaction throughout the crossing section. They are installed with an assortment of equipment used for excavation, placing material, and delivering and removing material. Stream dewatering and diversion around the work site is included. Channel bed material within the culvert varies according to prevailing stream characteristics at the crossing site and design velocities if they vary from upstream and downstream natural velocities. The culvert is placed within the roadway on a sub-excavated compacted bed, set at a slope that matches the design longitudinal profile, and backfilled with a bed mixture that mimics adjacent stream characteristics with attention to channel pattern. The roadway is replaced and any necessary armoring material is placed at the culvert inlet and outlet where it intersects the road fill prism. This scenario does not include additional measures needed to address channel incision, bank stability, and other factors associated with the presence of the stream crossing.RESOURCE CONCERNS: INADEQUATE HABITAT FOR FISH AND WILDLIFE ???Habitat degradation; EXCESS WATER ??? Ponding, flooding, seasonal high water table, seeps, and drifted snow; WATER QUALITY DEGRADATION ??? Elevated water temperature; SOIL EROSION??? Excessive bank erosion from streams shorelines or water conveyance channels. Contract associated practices separately to address site preparation and reclamation in the project footprint: (570) Stormwater Runoff Control, (500) Obstruction Removal, (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment; ---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management, --- Structural Measures outside of project footprint may include: (410) Grade Stabilization Structure, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection

Before Situation:

An existing undersized culvert has contributed to general bed and bank scour downstream of a road crossing, and may have contributed to the deposition of a wedge of sediment upstream of the road crossing. The road may be overtopped by high flows, resulting in outright failure, landowner accessibility problems, access by and to emergency services, and hamper post-flood recovery efforts. An upstream impoundment created by the undersized culvert has contributed to water quality problems including high water temperatures and the deposition and later mobilization of polluted fine sediment. Native aquatic organisms are unable to pass through the road crossing because the culvert outlet is perched above the downstream pool, and high velocities are not negotiable by animals that are able to leap into the culvert barrel.

After Situation:

The undersized culvert is replaced with a concrete box culvert that is sized, placed, and backfilled with material determined by geomorphic analyses performed in a reference reach upstream of the crossing location. Geomorphic and ecological functions are preserved through the crossing site, enhancing AOP, water quality, and culvert longevity. In addition, because the culvert is sized to promote the transport of streamflow and the materials it carries, it requires decreased maintenance activities over time. Landowners are able to access their holdings across a range of flows, and are able to seek and receive emergency and post-flood recovery services. Resource Concerns are addressed within the context of the site. Typical scenario is a 8'x6' concrete box culvert set on geotextile wrapped rock bedding under a two-lane road 24ft wide with two - 5ft shoulders. Includes headwalls and wingwalls with 1ft depth of natural bed material installed inside the box culvert. Culvert is placed to match stream angle - 48 ft feet length is used. Scenario typical size = (8'x6')x(38'+10)=2304 cu.ft.

Feature Measure: cross sectional area of box culvert x

Scenario Unit: Cubic Feet

Scenario Typical Size: 2,304.00

Scenario Total Cost: $137,460.54

Scenario Cost/Unit: $59.66

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	45	$25,518.60
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	511.1	$3,194.38
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hours	$145.01	48	$6,960.48
Water management, Flooding & dewatering	969	Includes equipment and power unit. Labor not included.	Acre Feet	$295.73	93	$27,502.89
Auger, Truck Mounted	2049	Truck mounted auger for large diameter excavation. Includes equipment and labor.	Hours	$113.27	2	$226.54
Crane, truck mounted, hydraulic, 80 ton	2569	80 ton capacity truck mounted hydraulic crane. Equipment cost only.	Hours	$349.47	8	$2,795.76
Labor						

Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	32	$1,403.84
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	88	$2,526.48
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	56	$2,247.28
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	40	$1,944.00
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	100	$11,145.00
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement.	Cubic Yards	$136.88	18	$2,463.84
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	511.1	$14,750.35
Geotextile, non-woven, heavy weight	1210	Non-woven greater than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	$1.89	101	$190.89
Aggregate, gravel, washed, pea gravel	1331	Washed and graded pea gravel river stone. Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$32.50	14.2	$461.50
Aggregate, river rock	1834	Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Ton	$25.51	22	$561.22
Culvert, box, 6 ft x 8 ft	2175	Precast concrete box culvert, 6 feet x 8 feet length. Typically in 4 foot sections. Materials only.	Feet	$442.58	48	$21,243.84
Sign, 3' x 2'	2259	.125 aluminum, single-sided, with nonreflective, EG reflective or HIP reflective face copy. Galvanized perforated square steel tube sign post with 2.5 x 30 inch non-perforated galvanized steel anchor, and Windbeam Bolt Assembly. Includes materials and shipping only.	Each	$223.56	2	$447.12
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	300	$300.00
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	2	$364.16
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	2	$1,846.38
Aggregate, Shipping, Cubic Yard-mile	2360	Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul).	Cubic Yard Mile	$0.42	22300	$9,366.00

Practice: 396 - Aquatic Organism Passage

Scenario: #11 - Bridge: Timber Decking, Timber Supports, Timber Pilings

Scenario Description:

A channel-spanning structure that carries a road or trail way across a river or stream. Constructed of prefabricated timber deck sections, bridges are attached at either end to timber piling abutments. Longer span bridges may require instream pilings to support the travel surface. Timber bridge decking is typically covered in asphalt surfacing which is not included in this scenario. Bridge design shop drawings are completed to conform to loading requirements and site conditions. Geotechnical investigations are used to determine the piling supports needed. Timber abutments are spaced to span the bankfull channel width at a minimum. Bridge components are delivered to the site and assembled by a combination of equipment and manual labor. They are installed with an assortment of equipment used for pile driving, excavation, placing material, delivering and removing material, and lifting bridge components from delivery trucks onto the constructed bridge support elements. Rock riprap over geotextile is placed on the stream side of the timber abutments as scour protection. The bridge will be constructed above the active channel. Scenario does not include additional measures needed to address channel incision, bank stability, and other factors associated with the presence of the bridge crossing. RESOURCE CONCERNS: INADEQUATE HABITAT FOR FISH AND WILDLIFE ???Habitat degradation; EXCESS WATER ??? Ponding, flooding, seasonal high water table, seeps, and drifted snow; WATER QUALITY DEGRADATION ??? Elevated water temperature; SOIL EROSION??? Excessive bank erosion from streams shorelines or water conveyance channels. Contract associated practices separately to address site preparation and reclamation in the project footprint: (570) Stormwater Runoff Control, (500) Obstruction Removal, (326) Clearing and Snagging, (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment; ---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management, ---Structural Measures outside of project footprint may include: (410) Grade Stabilization Structure, (582) Open Channel, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection

Before Situation:

An existing stream crossing is outfitted with an undersized culvert has a history of maintenance issues and failure. The downstream channel has experienced bed and bank scour, and the crossing may have to the deposition of a wedge of sediment upstream of the road. The road may be overtopped by high flows, resulting in outright failure, landowner accessibility problems, access by and to emergency services, and hamper post-flood recovery efforts. An upstream impoundment created by the undersized culvert has contributed to water quality problems including high water temperatures and the deposition and later mobilization of polluted fine sediment. Native aquatic organisms are unable to pass through the road crossing because the culvert outlet is perched above the downstream pool, and high velocities are not negotiable by animals that are able to leap into the culvert barrel.

After Situation:

The undersized culvert is replaced with a timber bridge placed on timber pilings. The bridge deck is composed of prefabricated timber panel decking, placed on timber beams and elevated, continuous railings run down each side connecting one abutment to its counterpart on the opposite bank. Signs on either approach indicate bridge capacity and weight restrictions. Because the bridge spans the active channel and sits atop the adjacent floodplain surface, geomorphic and ecological functions are preserved through the crossing site, enhancing AOP, water quality, and culvert longevity. Landowners are able to access their holdings across a range of flows, and are able to seek and receive emergency and post-flood recovery services. Resource Concerns are addressed within the context of the site. The typical scenario is a prefabricated timber bridge structure assembled on site and supported by timber pilings. The typical dimensions are a 20ft span, with a 20ft wide clear deck width with timber railings and total abutment height of 6 ft (2ft below grade and 4 ft above grade), the stream bankfull width is 20ft. Typical scenario = 20ft x 20ft x 6ft = 2,400 cu.ft.

Feature Measure: Bankful Width x Clear Deck Bridge

Scenario Unit: Cubic Feet

Scenario Typical Size: 2,400.00

Scenario Total Cost: $134,455.49

Scenario Cost/Unit: $56.02

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	52.5	$328.13
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hours	$145.01	40	$5,800.40
Water management, Flooding & dewatering	969	Includes equipment and power unit. Labor not included.	Acre Feet	$295.73	30	$8,871.90
Auger, Truck Mounted	2049	Truck mounted auger for large diameter excavation. Includes equipment and labor.	Hours	$113.27	2	$226.54
Crane, truck mounted, hydraulic, 100 ton	2570	100 ton capacity truck mounted hydraulic crane. Equipment cost only.	Hours	$366.20	40	$14,648.00
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	96	$4,211.52
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	112	$3,215.52
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	80	$3,210.40

Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	48	$2,332.80
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	125	$13,931.25
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement.	Cubic Yards	$136.88	24	$3,285.12
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	52.5	$1,515.15
Lumber, planks, posts and timbers, treated	1609	Treated dimension lumber with nominal thickness greater than 2 inches. Includes lumber and fasteners. Does not include labor.	Board Feet	$3.53	1440	$5,083.20
Sign, 3' x 2'	2259	.125 aluminum, single-sided, with nonreflective, EG reflective or HIP reflective face copy. Galvanized perforated square steel tube sign post with 2.5 x 30 inch non-perforated galvanized steel anchor, and Windbeam Bolt Assembly. Includes materials and shipping only.	Each	$223.56	2	$447.12
Structural Timber Piles, Treated Timber Bridge	2583	Timber Piles for timber bridge abutments, Includes materials only.	Board Feet	$2.75	4712	$12,958.00
Structural Timber Piles, Treated Timber Bridge	2583	Timber Piles for timber bridge abutments, Includes materials only.	Board Feet	$2.75	18624	$51,216.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	2	$364.16
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	2	$1,846.38
Aggregate, Shipping, Cubic Yard-mile	2360	Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul).	Cubic Yard Mile	$0.42	2295	$963.90

Practice: 396 - Aquatic Organism Passage

Scenario: #28 - Multi Plate Full Invert Culvert, Area Greater Than 124 sqft

Scenario Description:

A multi-plate galvanized steel or aluminum culvert (arch or box) used at a road-stream crossing to provide aquatic organism passage (AOP) and promote stream ecological and geomorphic function. Due to state regulations larger culverts are typically filled with a mixture of rock and gravel sized to emulate site stream conditions. The simulated streambed material is continuous throughout the culvert barrel, and blended with the intact streambed at the culvert inlet and outlet. The culvert span is selected according to channel bed composition and texture, bank characteristics, channel alignment at the crossing section, and other parameters that may affect channel dynamics and stability. Culvert length is determined by roadway geometry, loading requirements, and site stream conditions. Concrete or multiplate headwalls and wingwalls are typical for this scenario to facilitate a shorter installation which is preferable to limit the structure footprint in the watercourse. Multi plate full invert culverts are commonly delivered in sections and bolted together in the field. They are installed with an assortment of equipment used for excavation, placing material, and delivering and removing material. Stream dewatering and diversion around the work site is included. Channel bed material within the culvert barrel varies according to prevailing stream characteristics at the crossing site and design velocities if they vary from upstream and downstream natural velocities. The new culvert is set at a slope that matches the design longitudinal profile, and backfilled with a bed mixture that mimics adjacent stream characteristics with attention to channel pattern. Larger rock may be placed along the inside of the pipe as bank material. The roadway is replaced and any necessary armoring material is placed at the culvert inlet and outlet where it intersects the road fill prism. This scenario does not include additional measures needed to address channel incision, bank stability, and other factors associated with the presence of the stream crossing. RESOURCE CONCERNS: INADEQUATE HABITAT FOR FISH AND WILDLIFE ???Habitat degradation; EXCESS WATER ??? Ponding, flooding, seasonal high water table, seeps, and drifted snow; WATER QUALITY DEGRADATION ??? Elevated water temperature; SOIL EROSION??? Excessive bank erosion from streams shorelines or water conveyance channels. Contract associated practices to address site preparation and reclamation with the project footprint: (570) Stormwater Runoff Control, (500) Obstruction Removal, (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment; ---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management, ---Structural Measures outside of project footprint may include: (410) Grade Stabilization Structure, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection

Before Situation:

An existing undersized culvert as contributed to general bed and bank scour downstream of a road crossing, and may have contributed to the deposition of a wedge of sediment upstream of the road crossing. The road may be overtopped by high flows, resulting in outright failure, landowner accessibility problems, access by and to emergency services, and hamper post-flood recovery efforts. An upstream impoundment created by the undersized culvert has contributed to water quality problems including high water temperatures and the deposition and later mobilization of polluted fine sediment. Native aquatic organisms are unable to pass through the road crossing because the culvert outlet is perched above the downstream pool, and high velocities are not negotiable by animals that are able to leap into the culvert barrel.

After Situation:

The undersized culvert is replaced with an arch or box multi plate full invert culvert that is sized, placed, and backfilled with material determined by geomorphic analyses performed in a reference reach upstream of the crossing location. Geomorphic and ecological functions are preserved through the crossing site, enhancing AOP, water quality, and culvert longevity. In addition, because the culvert is sized to promote the transport of streamflow and the materials it carries, it requires decreased maintenance activities over time. Landowners are able to access their holdings across a range of flows, and are able to seek and receive emergency and post-flood recovery services. Resource Concerns are addressed within the context of the site. Typical scenario is a galvanized multi-plate pipe arch structure (7ga.) with a full invert and dimensions of 17'-11' x 11'-8' x 34' total culvert length under a two land road 24ft wide with two - 5ft shoulders. Includes headwalls and wingwalls as typical installation. Arch culvert is filled with 1ft depth of natural bed material. Published area of this structure = 163 sq.ft. Typical Scenario = 163 sq.ft. x (24 ft+10 ft) = 5,542 cu.ft.

Feature Measure: Published cross-sect area x (Length

Scenario Unit: Cubic Feet

Scenario Typical Size: 5,542.00

Scenario Total Cost: $180,174.55

Scenario Cost/Unit: $32.51

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	89	$50,470.12
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	865	$5,406.25
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hours	$145.01	40	$5,800.40
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$56.88	8	$455.04
Auger, Truck Mounted	2049	Truck mounted auger for large diameter excavation. Includes equipment and labor.	Hours	$113.27	2	$226.54
Crane, truck mounted, hydraulic, 80 ton	2569	80 ton capacity truck mounted hydraulic crane. Equipment cost only.	Hours	$349.47	6	$2,096.82
Sheet Piling, Steel, Temporary	2677	Temporary steel sheet piling, panels or barrier. Driven 22 to 38 psf panels driven 15 to 25 feet extracted and salvaged. Excludes wales. Includes materials, equipment and labor.	Square Feet	$23.19	1200	$27,828.00
Labor						

Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	20	$877.40
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	84	$2,411.64
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	8	$242.88
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	46	$1,845.98
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	24	$1,166.40
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	110	$12,259.50
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement.	Cubic Yards	$136.88	16.3	$2,231.14
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	865	$24,963.90
Aggregate, river rock	1834	Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Ton	$25.51	34	$867.34
Culvert, Multi-Plate arch	1979	Multi-plate arch culvert, typically 7 Gauge corrugated plate. Includes metal arch materials only, does not include footings.	Pound	$1.48	17204	$25,461.92
Sign, 3' x 2'	2259	.125 aluminum, single-sided, with nonreflective, EG reflective or HIP reflective face copy. Galvanized perforated square steel tube sign post with 2.5 x 30 inch non-perforated galvanized steel anchor, and Windbeam Bolt Assembly. Includes materials and shipping only.	Each	$223.56	2	$447.12
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	750	$750.00
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	2	$364.16
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	2	$1,846.38
Aggregate, Shipping, Cubic Yard-mile	2360	Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul).	Cubic Yard Mile	$0.42	27121.4	$11,390.99

Practice: 396 - Aquatic Organism Passage

Scenario: #29 - Multi Plate Full Invert Culvert, Area 124 sqft or Less

Scenario Description:

A multi-plate galvanized steel or aluminum culvert (arch or box) used at a road-stream crossing to provide aquatic organism passage (AOP) and promote stream ecological and geomorphic function. Due to state regulations larger culverts are typically filled with a mixture of rock and gravel sized to emulate site stream conditions and geomorphic units in the channel. The simulated streambed material is continuous throughout the culvert barrel, and blended with the intact streambed at the culvert inlet and outlet. The culvert span is selected according to channel bed composition and texture, bank characteristics, channel alignment at the crossing section, and other parameters that may affect channel dynamics and stability. Culvert length is determined by roadway geometry, loading requirements, and site stream conditions. Concrete or multiplate headwalls and wingwalls are typical for this scenario to facilitate a shorter installation which is preferable to limit the structure footprint in the watercourse. Multi plate full invert culverts are commonly delivered in sections and bolted together in the field. Smaller arches can be delivered in one piece. They are installed with an assortment of equipment used for excavation, placing material, and delivering and removing material. Stream dewatering and diversion around the work site is included. Channel bed material within the culvert barrel varies according to prevailing stream characteristics at the crossing site and design velocities if they vary from upstream and downstream natural velocities. The new culvert is set at a slope that matches the design longitudinal profile, and backfilled with a bed mixture that mimics adjacent stream characteristics with attention to channel pattern. Larger rock may be placed along the inside of the pipe as bank material. The roadway is replaced and any necessary armoring material is placed at the culvert inlet and outlet where it intersects the road fill prism. This scenario does not include additional measures needed to address channel incision, bank stability, and other factors associated with the presence of the stream crossing. RESOURCE CONCERNS: INADEQUATE HABITAT FOR FISH AND WILDLIFE ???Habitat degradation; EXCESS WATER ??? Ponding, flooding, seasonal high water table, seeps, and drifted snow; WATER QUALITY DEGRADATION ??? Elevated water temperature; SOIL EROSION??? Excessive bank erosion from streams shorelines or water conveyance channels. Contract associated practices separately to address site preparation and reclamation in the project footprint: (570) Stormwater Runoff Control, (500) Obstruction Removal, (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment; ---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management, ---Structural Measures outside of project footprint may include: (410) Grade Stabilization Structure, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection

Before Situation:

An existing undersized culvert has contributed to general bed and bank scour downstream of a road crossing, and may have contributed to the deposition of a wedge of sediment upstream of the road crossing. The road may be overtopped by high flows, resulting in outright failure, landowner accessibility problems, access by and to emergency services, and hamper post-flood recovery efforts. An upstream impoundment created by the undersized culvert has contributed to water quality problems including high water temperatures and the deposition and later mobilization of polluted fine sediment. Native aquatic organisms are unable to pass through the road crossing because the culvert outlet is perched above the downstream pool, and high velocities are not negotiable by animals that are able to leap into the culvert barrel.

After Situation:

The undersized culvert is replaced with a arch or box culvert sized, placed, and backfilled with material determined by geomorphic analyses performed in a reference reach upstream of the crossing location. Geomorphic and ecological functions are preserved through the crossing site, enhancing AOP, water quality, and culvert longevity. In addition, because the culvert is sized to promote the transport of streamflow and the materials it carries, it requires decreased maintenance activities over time. Landowners are able to access their holdings across a range of flows, and are able to seek and receive emergency and post-flood recovery services. Resource Concerns are addressed within the context of the site. Typical scenario is a galvanized multi-plate pipe arch structure (7ga.) with a full invert and dimensions of 12'-10' x 8'-4' x 34 ft culvert length under a two lane road 24ft wide with two-5ft shoulders. Includes headwalls and wingwalls as typical installation. Arch culvert is filled with 1ft depth of natural bed material. Published area of this structure = 85 sq.ft. Typical scenario = 85 sq.ft. x (24 ft+10 ft)=2890 cu.ft.

Feature Measure: Published cross-sect area x (Length

Scenario Unit: Cubic Feet

Scenario Typical Size: 2,890.00

Scenario Total Cost: $151,982.09

Scenario Cost/Unit: $52.59

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	77	$43,665.16
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	597	$3,731.25
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hours	$145.01	40	$5,800.40
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$56.88	8	$455.04
Auger, Truck Mounted	2049	Truck mounted auger for large diameter excavation. Includes equipment and labor.	Hours	$113.27	2	$226.54
Crane, truck mounted, hydraulic, 80 ton	2569	80 ton capacity truck mounted hydraulic crane. Equipment cost only.	Hours	$349.47	4	$1,397.88
Sheet Piling, Steel, Temporary	2677	Temporary steel sheet piling, panels or barrier. Driven 22 to 38 psf panels driven 15 to 25 feet extracted and salvaged. Excludes wales. Includes materials, equipment and labor.	Square Feet	$23.19	1000	$23,190.00
Labor						

Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	20	$877.40
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	84	$2,411.64
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	8	$242.88
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	44	$1,765.72
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	24	$1,166.40
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	94	$10,476.30
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement.	Cubic Yards	$136.88	12.6	$1,724.69
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	597	$17,229.42
Aggregate, river rock	1834	Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Ton	$25.51	24.6	$627.55
Culvert, Multi-Plate arch	1979	Multi-plate arch culvert, typically 7 Gauge corrugated plate. Includes metal arch materials only, does not include footings.	Pound	$1.48	13294	$19,675.12
Sign, 3' x 2'	2259	.125 aluminum, single-sided, with nonreflective, EG reflective or HIP reflective face copy. Galvanized perforated square steel tube sign post with 2.5 x 30 inch non-perforated galvanized steel anchor, and Windbeam Bolt Assembly. Includes materials and shipping only.	Each	$223.56	2	$447.12
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	750	$750.00
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	2	$364.16
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	2	$1,846.38
Aggregate, Shipping, Cubic Yard-mile	2360	Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul).	Cubic Yard Mile	$0.42	31301	$13,146.42

Practice: 396 - Aquatic Organism Passage

Scenario: #30 - Concrete Beam Bridge

Scenario Description:

A channel-spanning structure that carries a road or trailway across a river or stream. Constructed of concrete beams, bridges are attached at either end to abutments. Abutments are composted of a configuration of steel pilings under cast in place concrete. Bridge decking is reinforced concrete. Bridge design is completed to conform to loading requirements and site conditions. Geotechnical investigations are used to determine the best support structure suited to a given site. The bridge deck is designed to rest on beams and abutments placed on the adjacent floodplain. Bridge components are delivered to the site and assembled by a combination of equipment and manual labor. They are installed with an assortment of equipment used for excavation, placing material, delivering and removing material, and lifting bridge components from delivery trucks onto the constructed bridge support elements. The bridge will be constructed above the active channel. This scenario is applicable for spans up to 114ft on standard soils (poor soils or very high abutments will require design variations and are not considered typical). The typical scenario utilizes pre-cast concrete I beams (types I thru IV) supported by cast in place reinforced concrete abutments that are poured over 14in diameter steel pilings. Dimensions for the typical scenario are 60 ft span with a 35ft wide clear deck with reinforced concrete parapet and total abutment height of 8ft. This scenario does not include additional measures needed to address channel incision, bank stability, and other factors associated with the presence of the bridge crossing. RESOURCE CONCERNS: INADEQUATE HABITAT FOR FISH AND WILDLIFE ???Habitat degradation; EXCESS WATER ??? Ponding, flooding, seasonal high water table, seeps, and drifted snow; WATER QUALITY DEGRADATION ??? Elevated water temperature; SOIL EROSION??? Excessive bank erosion from streams shorelines or water conveyance channels. Contract associated practices separately to address site preparation and reclamation in the project footprint: (570) Stormwater Runoff Control, (500) Obstruction Removal, (326) Clearing and Snagging, (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment; ---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management, ---Structural Measures outside of project footprint may include: (410) Grade Stabilization Structure, (582) Open Channel, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection

Before Situation:

An existing stream crossing is outfitted with an undersized culvert has a history of maintenance issues and failure. The downstream channel has experienced bed and bank scour, and the crossing may have to the deposition of a wedge of sediment upstream of the road. The road may be overtopped by high flows, resulting in outright failure, landowner accessibility problems, access by and to emergency services, and hamper post-flood recovery efforts. An upstream impoundment created by the undersized culvert or crossing has contributed to water quality problems including high water temperatures and the deposition and later mobilization of polluted fine sediment. Native aquatic organisms are unable to pass through the road crossing because the culvert outlet is perched above the downstream pool, and high velocities are not negotiable by animals that are able to leap into the culvert barrel.

After Situation:

The undersized culvert is replaced with a concrete beam bridge placed on steel piling supported concrete abutments. The bridge deck is composed of reinforced concrete, and elevated, continuous railings run down each side connecting one abutment to its counterpart on the opposite bank. Signs on either approach indicate bridge capacity and weight restrictions. Because the bridge spans the active channel and sits atop the adjacent floodplain surface, geomorphic and ecological functions are preserved through the crossing site, enhancing AOP, water quality, and culvert longevity. Landowners are able to access their holdings across a range of flows, and are able to seek and receive emergency and post-flood recovery services. Resource Concerns are addressed within the context of the site. This scenario is applicable for spans up to 114ft on standard soils (poor soils or very high abutments will require design variations). The typical scenario utilizes pre-cast concrete I beams (types I thru IV) supported by cast in place reinforced concrete abutments that are poured over 14in diameter steel pilings. Dimensions for the typical scenario are 60 ft span with a 35ft wide clear deck with reinforced concrete parapet and total abutment height of 8ft. Typical scenario = 35 ft x 60 ft x 8 ft = 16,800 cu.ft.

Feature Measure: Bankful Width x Clear Deck Bridge

Scenario Unit: Cubic Feet

Scenario Typical Size: 16,800.00

Scenario Total Cost: $493,536.37

Scenario Cost/Unit: $29.38

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	221.6	$125,664.93
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hours	$145.01	40	$5,800.40
Truck, Concrete Pump	1211	Concrete pump, normally truck mounted. Use this item in association with other concrete components when job requires placement by other than normal chutes. Include drive and setup time in quantity; therefore, do not include mobilization. Includes equipment and operator.	Hours	$158.51	18	$2,853.18
Hauling, bulk, highway truck	1615	Hauling of bulk earthfill, rockfill, waste or debris. One-way travel distance using fully loaded highway dump trucks (typically 16 CY or 20 TN capacity). Includes equipment and labor for truck only. Does not include cost for loading truck.	Cubic Yard Mile	$0.36	22200	$7,992.00
Auger, Truck Mounted	2049	Truck mounted auger for large diameter excavation. Includes equipment and labor.	Hours	$113.27	2	$226.54
Crane, truck mounted, hydraulic, 100 ton	2570	100 ton capacity truck mounted hydraulic crane. Equipment cost only.	Hours	$366.20	10	$3,662.00

Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	16	$701.92
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	84	$2,411.64
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	50	$2,006.50
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	80	$3,888.00
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement.	Cubic Yards	$136.88	241	$32,988.08
Steel, structural steel members	1779	Structural steel, includes materials and fabrication.	Pound	$1.73	131400	$227,322.00
Sign, 3' x 2'	2259	.125 aluminum, single-sided, with nonreflective, EG reflective or HIP reflective face copy. Galvanized perforated square steel tube sign post with 2.5 x 30 inch non-perforated galvanized steel anchor, and Windbeam Bolt Assembly. Includes materials and shipping only.	Each	$223.56	2	$447.12
Precast concrete 'I' Beam	2642	Precast, prestressed concrete 'I' beam for cast-in-place concrete bridge. Material only.	Feet	$166.03	420	$69,732.60
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	750	$750.00
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	2	$1,846.38
Aggregate, Shipping, Cubic Yard-mile	2360	Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul).	Cubic Yard Mile	$0.42	12050	$5,061.00

Practice: 396 - Aquatic Organism Passage

Scenario: #62 - Bridge, Manufactured, Foundation Modification

Scenario Description:

A channel-spanning structure constructed from a manufactured concrete or steel bridge structure that has been certified by a PE that carries a road or trail way across a river or stream. Bridge design is completed to conform to loading requirements and site conditions. The bridge deck is designed to rest on abutments placed on the adjacent floodplain. Projects located in alluvial, estuarine, or tidally influenced areas, where soils are considered 'soft' with low bearing capacity and high potential for settlement or consolidation. These projects typically require a large quantity of over-excavation to remove unsuitable soils, backfill with engineered fill material, and manual compaction to support a new structure for fish passage. Bridge components are delivered to the site and assembled by a combination of equipment and manual labor. They are installed with an assortment of equipment used for excavation, placing material, delivering and removing material, and lifting bridge components from delivery trucks onto the constructed bridge support elements. Other actions include construction staking and signage. Scenario does not include additional measures needed to address channel incision, bank stability, and other factors associated with the presence of the bridge crossing. RESOURCE CONCERNS: INADEQUATE HABITAT FOR FISH AND WILDLIFE ???Habitat degradation; EXCESS WATER ??? Ponding, flooding, seasonal high water table, seeps, and drifted snow; WATER QUALITY DEGRADATION ??? Elevated water temperature; SOIL EROSION??? Excessive bank erosion from streams shorelines or water conveyance channels Contract associated Practices to address site preparation and reclamation in the project footprint: (570) Storm Runoff Control, (500) Obstruction Removal, (326) Clearing and Snagging, (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment; (395) Stream Habitat Improvement and Management, --- Structural Measures outside of project footprint may include; (410) Grade Stabilization Structure, (582) Open Channel, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection

Before Situation:

An existing undersized culvert creates an upstream passage blockage to fish and other aquatic organisms. The existing crossing does not meet State or Federal fish passage guidance.

After Situation:

The undersized culvert is replaced with a manufactured bridge placed on precast concrete abutments. The bridge deck is composed of concrete or steel and elevated, continuous railings run down each side connecting one abutment to its counterpart on the opposite bank. Signs on either approach indicate bridge capacity and weight restrictions. Because the bridge spans the active channel and sits atop the adjacent floodplain surface, geomorphic and ecological functions are preserved through the crossing site, enhancing AOP, water quality, and culvert longevity. Resource Concerns are addressed within the context of the site. Typical Scenario is for a 30' span bridge 15' wide on precast concrete abutments.

Feature Measure: Linear feet of bridge deck, lenght-w

Scenario Unit: Linear Feet

Scenario Typical Size: 30.00

Scenario Total Cost: $115,479.71

Scenario Cost/Unit: $3,849.32

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	18	$10,207.44
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.11	67	$74.37
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	154	$962.50
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	80	$5,294.40
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hours	$145.01	20	$2,900.20
Water management, Flooding & dewatering	969	Includes equipment and power unit. Labor not included.	Acre Feet	$295.73	50	$14,786.50
Truck, dump, 12 CY	1215	Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only.	Hours	$104.69	40	$4,187.60
Auger, Truck Mounted	2049	Truck mounted auger for large diameter excavation. Includes equipment and labor.	Hours	$113.27	2	$226.54
Crane, truck mounted, hydraulic, 100 ton	2570	100 ton capacity truck mounted hydraulic crane. Equipment cost only.	Hours	$366.20	20	$7,324.00
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	34	$1,491.58
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	124	$3,560.04

Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	160	$6,420.80
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	40	$1,944.00
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	80	$8,916.00
Materials						
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$23.32	119	$2,775.08
Geocell, 6 inch	1842	6-inch thick cellular confinement system, three-dimensional, expandable panels made from high-density polyethylene (HDPE), polyester or another polymer material. Includes materials, labor and equipment for the geocell only, does not include backfill.	Square Yard	$27.61	67	$1,849.87
Bridge, steel or concrete, pre-Manufactured Bridge	2193	A premanufactured steel or precast prestressed concrete bridge rated for an HS 25 highway loading. Typical width is 14 ft., length is variable. Includes railing system. Includes materials and shipping only.	Square Feet	$79.75	450	$35,887.50
Sign, 3' x 2'	2259	.125 aluminum, single-sided, with nonreflective, EG reflective or HIP reflective face copy. Galvanized perforated square steel tube sign post with 2.5 x 30 inch non-perforated galvanized steel anchor, and Windbeam Bolt Assembly. Includes materials and shipping only.	Each	$223.56	2	$447.12
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	750	$750.00
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	2	$364.16
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	2	$1,846.38
Aggregate, Shipping, Cubic Yard-mile	2360	Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul).	Cubic Yard Mile	$0.42	5950	$2,499.00

Practice: 397 - Aquaculture Pond

Scenario: #1 - Excavated

Scenario Description:

Typical practice is 1.0 acre pond surface area (120 ft x 363 ft), 3:1 side slopes, average 7.5' depth, flat ground and no harvest kettle. The construction of an aquaculture pond to facilitate the efficient collection and transfer of waste, the containment of cultured fish, efficient use of water and the maintenance of water quality. The resource concerns addressed include excess nutrients in surface and ground waters, inefficient water use, and habitat degradation. Typical pond outlet is Structure for Water Control (587). Costs include all equipment necessary to excavate, grade and shape an aquaculture pond. Structure for Water Control not included.

Before Situation:

In the before situation, an aquaculture producer has an aquaculture pond system or plans to install an aquaculture pond system that has one or more of the following concerns: excessive seepage or frequent release of nutrient laden aquaculture water, potential of loss of non-native aquaculture production fish species to the native environment, and/or poor growing conditions for the current aquaculture species.

After Situation:

Aquaculture pond typically a 1.0 acre pond surface area (120 ft x 363 ft), 3:1 side slopes, average 7.5' depth, flat ground no harvest kettle. The practice is installed using large earth moving equipment. Drainage tile, if needed, will be installed accoring to Subsurface Drain (606). Outlets, if needed will be installed using Structure for Water Control (587). Liner if needed will be installed using Pond Sealing or Lining (520, 521 or 522). Other associated practices are Critical Area Planting (342), Fence (382), Underground Outlet (620), Mulching (484), Water Well (642), Pumping Plant (533), Pipeline (516), Heavy Use Area Protection (561), Access Road (560), Subsurface Drain (606) may also be needed and will be installed using those standards as appropriate.

Feature Measure: Surface Area of Aquaculture Pond (

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $26,182.34

Scenario Cost/Unit: $26,182.34

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$100.26	47	$4,712.22
Excavation, common earth, side cast, large equipment	1227	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$1.61	9363	$15,074.43
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	96	$2,756.16
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	58	$2,327.54
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	8	$388.80
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 397 - Aquaculture Pond

Scenario: #2 - Excavated With Harvest Kettle

Scenario Description:

Typical practice is 1.0 acre pond surface area (120 ft x 363 ft), 3:1 side slopes, average 7.5' depth, flat ground with a harvest kettle (4'x14'x16') constructed with 19.0 CY of reinforced concrete. The construction of an aquaculture pond to facilitate the efficient collection and transfer of waste, the containment of cultured fish, efficient use of water and the maintenance of water quality. The resource concerns addressed include excess nutrients in surface and ground waters, inefficient water use, and habitat degradation. Typical pond outlet is Structure for Water Control (587). Costs include all equipment necessary to excavate, grade and shape an aquaculture pond, and a reinforced concrete ???harvest kettle???. Structure for Water Control not included.

Before Situation:

In the before situation, an aquaculture producer has an aquaculture pond system or plans to install an aquaculture pond system that has one or more of the following concerns: excessive seepage or frequent release of nutrient laden aquaculture water, potential of loss of non-native aquaculture production fish species to the native environment, and/or poor growing conditions for the current aquaculture species.

After Situation:

Aquaculture pond typically a 1.0 acre pond surface area (120 ft x 363 ft), 3:1 side slopes, average 7.5' depth, flat ground with a harvest kettle (4'x14'16') constructed with 19.0 CY of reinforced concrete (8' thick walls and floor). The practice is installed using large earth moving equipment. Reinforced concrete harvest kettle is installed with laborers. Drainage tile, if needed, will be installed according to Subsurface Drain (606). Outlets, if needed will be installed using Structure for Water Control (587). Liner if needed will be installed using Pond Sealing or Lining (520, 521 or 522). Other associated practices are Critical Area Planting (342), Fence (382), Underground Outlet (620), Mulching (484), Water Well (642), Pumping Plant (533), Pipeline (516), Heavy Use Area Protection (561), Access Road (560), Subsurface Drain (606) may also be needed and will be installed using those standards as appropriate.

Feature Measure: Surface Area of Aquaculture Pond (

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $43,492.88

Scenario Cost/Unit: $43,492.88

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	19	$10,774.52
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	74	$296.74
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$100.26	48	$4,812.48
Excavation, common earth, side cast, large equipment	1227	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$1.61	9479	$15,261.19
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	10	$438.70
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	130	$3,732.30
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	58	$2,327.54
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	12	$583.20
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	74	$2,246.64
Dimension Lumber, Treated	1044	Treated dimension lumber with nominal thickness equal or less than 2 inches. Includes lumber and fasteners	Board Feet	$1.79	100	$179.00
Mobilization						

Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	71	$71.00
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	3	$2,769.57

Practice: 397 - Aquaculture Pond

Scenario: #3 - Partial Embankment

Scenario Description:

Typical practice is 1.0 acre pond surface area (120 ft x 363 ft), 3:1 side slopes, average 7.5' depth, sloped ground, fill on lower end, cut and fill balances and no harvest kettle. The construction of an aquaculture pond to facilitate the efficient collection and transfer of waste, the containment of cultured fish, efficient use of water and the maintenance of water quality. The resource concerns addressed include excess nutrients in surface and ground waters, inefficient water use, and habitat degradation. Typical pond outlet is Structure for Water Control (587). Costs include all equipment necessary to excavate, grade and shape an aquaculture pond. Structure for Water Control not included.

Before Situation:

In the before situation, an aquaculture producer has an aquaculture pond system or plans to install an aquaculture pond system that has one or more of the following concerns: excessive seepage or frequent release of nutrient laden aquaculture water, potential of loss of non-native aquaculture production fish species to the native environment, and/or poor growing conditions for the current aquaculture species.

After Situation:

Aquaculture pond typically is a 1.0 acre pond surface area (120 ft x 363 ft), 3:1 side slopes, average 7.5' depth, sloped ground, fill on lower end, cut and fill balances, and no harvest kettle. The practice is installed using large earth moving equipment. Drainage tile, if needed, will be installed according to Subsurface Drain (606). Outlets, if needed will be installed using Structure for Water Control (587). Liner if needed will be installed using Pond Sealing or Lining (520, 521or 522). Other associated practices are Critical Area Planting (342), Fence (382), Underground Outlet (620), Mulching (484), Water Well (642), Pumping Plant (533), Pipeline (516), Heavy Use Area Protection (561), Access Road (560), Subsurface Drain (606), and Spoil Spreading (572) may also be needed and will be installed using those standards as appropriate.

Feature Measure: Surface Area of Aquaculture Pond (

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $38,558.31

Scenario Cost/Unit: $38,558.31

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	4682	$18,774.82
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$100.26	48	$4,812.48
Excavation, common earth, side cast, large equipment	1227	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$1.61	4682	$7,538.02
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	74	$2,124.54
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	56	$2,247.28
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	6	$291.60
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	3	$2,769.57

Practice: 397 - Aquaculture Pond

Scenario: #4 - Partial Embankment With Harvest Kettle

Scenario Description:

Typical practice is 1.0 acre pond surface area (120 ft x 363 ft), 3:1 side slopes, average 7.5' depth, sloped ground, fill on lower end, cut and fill balances, includes a harvest kettle (4'x14'x16') constructed with 19.0 CY of reinforced concrete. The construction of an aquaculture pond to facilitate the efficient collection and transfer of waste, the containment of cultured fish, efficient use of water and the maintenance of water quality. The resource concerns addressed include excess nutrients in surface and ground waters, inefficient water use, and habitat degradation. Typical pond outlet is Structure for Water Control (587). Costs include all equipment necessary to excavate, grade and shape an aquaculture pond, and a reinforce concrete ???harvest kettle???. Structure for Water Control not included.

Before Situation:

In the before situation, an aquaculture producer has an aquaculture pond system or plans to install an aquaculture pond system that has one or more of the following concerns: excessive seepage or frequent release of nutrient laden aquaculture water, potential of loss of non-native aquaculture production fish species to the native environment, and/or poor growing conditions for the current aquaculture species.

After Situation:

Aquaculture pond typically a 1.0 acre pond surface area (120 ft x 363 ft), 3:1 side slopes, average 7.5' depth, sloped ground, fill on lower end, cut and fill balances, includes a harvest kettle (4'x14'16') constructed with 19.0 CY of reinforced concrete (8' thick walls and floor). The practice is installed using large earth moving equipment. Reinforced concrete harvest kettle is installed with laborers. Drainage tile, if needed, will be installed according to Subsurface Drain (606). Outlets, if needed will be installed using Structure for Water Control (587). Liner if needed will be installed using Pond Sealing or Lining (520, 521 or 522). Other associated practices are Critical Area Planting (342), Fence (382), Underground Outlet (620), Mulching (484), Water Well (642), Pumping Plant (533), Pipeline (516), Heavy Use Area Protection (561), Access Road (560), Subsurface Drain (606), and Spoil Spreading (572) may also be needed and will be installed using those standards as appropriate.

Feature Measure: Surface Area of Aquaculture Pond (

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $54,597.43

Scenario Cost/Unit: $54,597.43

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	19	$10,774.52
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	4756	$19,071.56
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$100.26	52	$5,213.52
Excavation, common earth, side cast, large equipment	1227	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$1.61	4682	$7,538.02
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	10	$438.70
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	110	$3,158.10
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	60	$2,407.80
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	15	$729.00
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	74	$2,246.64
Dimension Lumber, Treated	1044	Treated dimension lumber with nominal thickness equal or less than 2 inches. Includes lumber and fasteners	Board Feet	$1.79	100	$179.00
Mobilization						

Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	71	$71.00
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	3	$2,769.57

Practice: 402 - Dam

Scenario: #7 - pipe principal spillway

Scenario Description:

This scenario is the construction of an earthen embankment to impound water. A corrugated metal pipe (CMP) principal spillway will be constructed. A metal trash guard protects the spillway inlet. A circular CMP riser connects to a CMP barrel that runs through the dam to outlet safely downstream. A sand diaphram is installed in the embankment. This scenario assists in addressing the resource concerns: excessive runoff, flooding or ponding, inefficient water use on irrigated land, reduced capacity of conveyances by sediment deposition.

Before Situation:

Area exists where water could naturally pool or run off to create a pond for livestock, wildlife, fire control, flood control, or irrigation. The site meets satisfactory conditions according to the standard.

After Situation:

The typical dam is constructed by excavation and compaction to create an embankment. The principal spillway is completed by using a CMP riser with a metal trash gaurd and a CMP barrel. A sand diaphragm is installed. Vegetation will be completed under Critical Area Planting (342) standard. . Other associated practices such as; Fence (382), Pipeline (516), Pumping Plant (533), Watering Facility (614), Structure For Water Control (587), and Aquatic Organism Passage (396) will use the corresponding Standard(s) as appropriate.

Feature Measure: Embankment Volume

Scenario Unit: Cubic Yards

Scenario Typical Size: 25,000.00

Scenario Total Cost: $177,102.42

Scenario Cost/Unit: $7.08

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	1	$567.08
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	25000	$63,000.00
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	25000	$100,250.00
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	90	$562.50
Trenching, Earth, 12 in. x 48 in.	53	Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling	Feet	$1.43	130	$185.90
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	21	$921.27
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	20	$574.20
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	40	$1,944.00
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	52	$1,500.72
Pipe, CMP, 18-16 gauge, weight priced	1322	18 and 16 gauge galvanized helical corrugated metal pipe priced by the weight of the pipe materials. Materials only.	Pound	$2.00	2790	$5,580.00
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.29	62.1	$142.21
Trash Guard, metal	1608	Trash Guard, fabricated-steel, includes materials, equipment, and labor to transport and place Conical shaped trash guard for drop inlet spillway. Typically fabricated of CMP and steel. Includes materials, equipment, and labor to fabricate and transport.	Pound	$2.72	60	$163.20
Mobilization						

Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 410 - Grade Stabilization Structure

Scenario: #1 - Fabric Reinforced Vegetated Chute

Scenario Description:

A chute structure constructed of a fabric reinforced vegetated channel. These structures are used to stabilized the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a channel area that is 12 feet wide and 30 feet in length (360 square feet). The unit of payment measurement is defined as the square footage of the chute channel. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Before Situation:

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

After Situation:

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Channel Bed Stabilization (584), Dike (356), Grassed Waterway (412), Structure for Water Control (587), Subsurface Drain (606), and Underground Outlet (620) will use the corresponding Standard(s) as appropriate.

Feature Measure: Chute Channel Area

Scenario Unit: Square Feet

Scenario Typical Size: 360.00

Scenario Total Cost: $1,783.85

Scenario Cost/Unit: $4.96

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	107	$269.64
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement.	Cubic Yards	$136.88	2.7	$369.58
Turf reinforcement mat	1212	Synthetic turf reinforcement mat with staple anchoring. Includes materials, equipment and labor.	Square Yard	$9.50	40	$380.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 410 - Grade Stabilization Structure

Scenario: #2 - Concrete Block or Rock Chute

Scenario Description:

A chute structure constructed of a rock riprap, precast concrete block or cable concrete. These structures are used to stabilized the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a channel area that is 12 feet wide and 60 feet in length (720 square feet). The unit of payment measurement is defined as the square footage of the chute channel including inlet and outlet sections. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Before Situation:

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

After Situation:

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Channel Bed Stabilization (584), Dike (356), Grassed Waterway (412), Structure for Water Control (587), Subsurface Drain (606), and Underground Outlet (620) will use the corresponding Standard(s) as appropriate.

Feature Measure: Chute Channel Area

Scenario Unit: Square Feet

Scenario Typical Size: 720.00

Scenario Total Cost: $12,632.76

Scenario Cost/Unit: $17.55

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	10	$783.00
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	10	$1,305.10
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	20	$802.60
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement.	Cubic Yards	$136.88	60	$8,212.80
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 410 - Grade Stabilization Structure

Scenario: #3 - Culvert Outlet Protection, MN TR3

Scenario Description:

A rock outlet structure constructed using riprap below a culvert outlet designed according to MN TR3. These structures are used to stabilize the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a 3' culvert requiring a 1' deep x 6'wide x 9'long rock basin. The unit of payment measurement is each. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Before Situation:

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

After Situation:

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Channel Bed Stabilization (584), Dike (356), Grassed Waterway (412), Structure for Water Control (587), Subsurface Drain (606), and Underground Outlet (620) will use the corresponding Standard(s) as appropriate.

Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $2,815.99

Scenario Cost/Unit: $2,815.99

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	4	$522.04
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	4	$160.52
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement.	Cubic Yards	$136.88	10	$1,368.80
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 410 - Grade Stabilization Structure

Scenario: #4 - Plunge pool, Design Note-6

Scenario Description:

A rock outlet structure constructed using riprap below a culvert outlet designed according to Design note 6. These structures are used to stabilize the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a 18' outlet requiring a 3' deep basin with a 3'wide x 3'long bottom. The unit of payment measurement is each. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Before Situation:

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

After Situation:

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Channel Bed Stabilization (584), Dike (356), Grassed Waterway (412), Structure for Water Control (587), Subsurface Drain (606), and Underground Outlet (620) will use the corresponding Standard(s) as appropriate.

Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $7,604.95

Scenario Cost/Unit: $7,604.95

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	8	$1,044.08
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	8	$321.04
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement.	Cubic Yards	$136.88	40	$5,475.20
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 410 - Grade Stabilization Structure

Scenario: #5 - Timber Toewall

Scenario Description:

A Straight Drop structure constructed using treated posts and planks. These structures are used to stabilize the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon an 16 foot weir length and 2 foot drop. The unit of payment measurement is each. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Before Situation:

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

After Situation:

Area is stabilized using using an engineered structure. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Channel Bed Stabilization (584), Dike (356), Grassed Waterway (412), Structrue for Water Control (587), Subsurface Drain (606), and Underground Outlet (620) will use the corresponding Standard(s) as appropriate.

Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $4,306.29

Scenario Cost/Unit: $4,306.29

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	8	$1,044.08
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	12	$344.52
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	8	$321.04
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement.	Cubic Yards	$136.88	9	$1,231.92
Lumber, planks, posts and timbers, treated	1609	Treated dimension lumber with nominal thickness greater than 2 inches. Includes lumber and fasteners. Does not include labor.	Board Feet	$3.53	170	$600.10
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 410 - Grade Stabilization Structure

Scenario: #8 - Drop Inlet to Culvert

Scenario Description:

A Box Drop structure composed of reinforced concrete used to stabilized the grade just upstream of a culvert. Ths structure's purpose is to control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a concrete wall structure with a drop of 4ft and weir length of 12ft. The unit of payment measurement is defined as each. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Before Situation:

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

After Situation:

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Channel Bed Stabilization (584), Dike (356), Grassed Waterway (412), Structure for Water Control (587), Subsurface Drain (606), and Underground Outlet (620) will use the corresponding Standard(s) as appropriate.

Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $6,102.61

Scenario Cost/Unit: $6,102.61

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	4	$2,268.32
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.11	16	$17.76
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	5	$391.50
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	5	$652.55
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	10	$401.30
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	8	$242.88
Rock Riprap, graded, angular, material and shipping	1200	Graded Rock Riprap for all gradation ranges. Includes materials and local delivery within 20 miles of quarry. Placement costs are not included.	Ton	$37.44	16	$599.04
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 410 - Grade Stabilization Structure

Scenario: #9 - Side Inlet Structure

Scenario Description:

An side inlet structure to stabilize the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a typical amount of earthfill of 400 cubic yards, and 20 feet of 30' 16 gauge CMP pipe with a hood inlet. A small, non-lined plunge pool protects the outlet channel. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Before Situation:

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

After Situation:

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Pumping Plant (533), Watering Facility (614), and Livestock Pipeline (516) will use the corresponding Standard(s) as appropriate.

Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $4,649.56

Scenario Cost/Unit: $4,649.56

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	150	$601.50
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	30	$187.50
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	5	$652.55
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	5	$143.55
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	5	$200.65
Materials						
Pipe, CMP, 14-12 gauge, weight priced	1589	14 and 12 gauge galvanized helical corrugated metal pipe priced by the weight of the pipe materials. Materials only.	Pound	$0.93	1435	$1,334.55
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 410 - Grade Stabilization Structure

Scenario: #11 - Embankment Dam - Drainage Area 0 to 10 Acres

Scenario Description:

An earthen embankment dam with a drainage area of 0 to 10 acres. Assessment shows anti-seep collars or sand diaphragm are needed for seepage control. To stabilize the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a typical amount of earthfill of 800 cubic yards, and 80 feet of pipe 10' PVC pipe with a hood inlet. A small, non-lined plunge pool protects the outlet channel. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Before Situation:

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

After Situation:

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Land Clearing (460), Obstruction Removal (500), Pumping Plant (533), Watering Facility (614), and Livestock Pipeline (516) will use the corresponding Standard(s) as appropriate.

Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $10,613.39

Scenario Cost/Unit: $10,613.39

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	1	$501.25
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	879	$3,524.79
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	52	$325.00
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	6	$783.06
Excavation, common earth, side cast, large equipment	1227	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$1.61	112	$180.32
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	16	$459.36
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	6	$240.78
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	7	$202.02
Steel, Plate, 1/8 in.	1047	Flat Steel Plate, 1/8 inch thick, materials only.	Square Feet	$7.51	3	$22.53
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.29	612	$1,401.48
Steel, Angle, 2 1/2 in. x 2 1/2 in. x 1/4 in.	1372	Materials: Angle, 2 1/2 inch x 2 1/2 inch x 1/4 inch. Meets ASTM A36	Feet	$4.19	8	$33.52
Cattle Panel	1409	Welded wire cattle panel typically 1/4 inch galvanized steel rods, 50 in. high x 16 ft. long. Materials only.	Each	$32.94	1	$32.94
Lumber, planks, posts and timbers, treated	1609	Treated dimension lumber with nominal thickness greater than 2 inches. Includes lumber and fasteners. Does not include labor.	Board Feet	$3.53	77	$271.81
Mobilization						

Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 410 - Grade Stabilization Structure

Scenario: #13 - Embankment Dam - Drainage Area 10.1 to 40 Acres

Scenario Description:

An earthen embankment dam with a drainage area of 10.1 to 40 acres, anti-seep collars or sand diaphragm, and excavated plunge pool basin. Installed to stabilize the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a typical amount of earthfill of 2000 cubic yards, and 90 feet of pipe 12' PVC pipe with a hood inlet and 7 cubic yard sand diaphragm. A non-lined plunge pool protects the outlet channel. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Before Situation:

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

After Situation:

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Land Clearing (460), Obstruction Removal (500), Pumping Plant (533), Watering Facility (614), and Livestock Pipeline (516) will use the corresponding standard(s) as appropriate.

Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $16,693.63

Scenario Cost/Unit: $16,693.63

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	1	$501.25
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	1905	$7,639.05
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	59	$368.75
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	8	$1,044.08
Excavation, common earth, side cast, large equipment	1227	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$1.61	245	$394.45
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	16	$459.36
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	8	$321.04
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement.	Cubic Yards	$136.88	5	$684.40
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	7	$202.02
Steel, Plate, 1/8 in.	1047	Flat Steel Plate, 1/8 inch thick, materials only.	Square Feet	$7.51	3	$22.53
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.29	910	$2,083.90
Steel, Angle, 2 1/2 in. x 2 1/2 in. x 1/4 in.	1372	Materials: Angle, 2 1/2 inch x 2 1/2 inch x 1/4 inch. Meets ASTM A36	Feet	$4.19	8	$33.52
Cattle Panel	1409	Welded wire cattle panel typically 1/4 inch galvanized steel rods, 50 in. high x 16 ft. long. Materials only.	Each	$32.94	1	$32.94
Lumber, planks, posts and timbers, treated	1609	Treated dimension lumber with nominal thickness greater than 2 inches. Includes lumber and fasteners. Does not include labor.	Board Feet	$3.53	77	$271.81

Mobilization

Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 410 - Grade Stabilization Structure

Scenario: #15 - Embankment Dam - Drainage Area 40.1 to 100 Acres

Scenario Description:

An earthen embankment dam with a drainage area of 40.1 to 100 acres, sand diaphragm, and excavated plunge pool basin. Installed to stabilize the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a typical amount of earthfill of 3000 cubic yards, 94 feet of 18' CMP pipe with 30' riser, and 14 cubic yard sand diaphragm and outlet. A non-lined plunge pool protects the outlet channel. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Before Situation:

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

After Situation:

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Land Clearing (460), Obstruction Removal (500), Pumping Plant (533), Watering Facility (614), and Livestock Pipeline (516) will use the corresponding standard(s) as appropriate.

Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $33,831.38

Scenario Cost/Unit: $33,831.38

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formless, non reinforced	36	Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$220.05	1	$220.05
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	1	$501.25
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	3015	$12,090.15
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	84	$525.00
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$100.26	12	$1,203.12
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	20	$2,610.20
Water management, Flooding & dewatering	969	Includes equipment and power unit. Labor not included.	Acre Feet	$295.73	3	$887.19
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yards	$0.87	1210	$1,052.70
Excavation, common earth, side cast, large equipment	1227	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$1.61	306	$492.66
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	30	$1,316.10
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	24	$689.04
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	32	$1,284.16
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement.	Cubic Yards	$136.88	21	$2,874.48

Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	14	$404.04
Pipe, CMP, 18-16 gauge, weight priced	1322	18 and 16 gauge galvanized helical corrugated metal pipe priced by the weight of the pipe materials. Materials only.	Pound	$2.00	2050	$4,100.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	2	$364.16
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	3	$2,293.89
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 410 - Grade Stabilization Structure

Scenario: #16 - Embankment Dam - Drainage Area >100 Acres

Scenario Description:

An earthen embankment dam with a drainage area of more than 100 acres, sand diaphragm, and excavated plunge pool basin. Installed to stabilize the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a typical amount of earthfill of 4000 cubic yards, 106 feet of 36' CMP pipe with 48' riser, and 22 cubic yard sand diaphragm and outlet. A non-lined plunge pool protects the outlet channel. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Before Situation:

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

After Situation:

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Pumping Plant (533), Obstruction Removal (500), Land Clearing (460), Watering Facility (614), and Livestock Pipeline (516) will use the corresponding Standard(s) as appropriate.

Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $44,990.94

Scenario Cost/Unit: $44,990.94

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formless, non reinforced	36	Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$220.05	2	$440.10
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	2	$1,002.50
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	4323	$17,335.23
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	220	$1,375.00
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$100.26	14	$1,403.64
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	20	$2,610.20
Water management, Flooding & dewatering	969	Includes equipment and power unit. Labor not included.	Acre Feet	$295.73	4	$1,182.92
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yards	$0.87	2017	$1,754.79
Excavation, common earth, side cast, large equipment	1227	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$1.61	434	$698.74
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	30	$1,316.10
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	24	$689.04
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	34	$1,364.42
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement.	Cubic Yards	$136.88	21	$2,874.48

Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	22	$634.92
Pipe, CMP, 18-16 gauge, weight priced	1322	18 and 16 gauge galvanized helical corrugated metal pipe priced by the weight of the pipe materials. Materials only.	Pound	$2.00	400	$800.00
Pipe, CMP, 14-12 gauge, weight priced	1589	14 and 12 gauge galvanized helical corrugated metal pipe priced by the weight of the pipe materials. Materials only.	Pound	$0.93	6178	$5,745.54
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	3	$546.24
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	3	$2,293.89
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 410 - Grade Stabilization Structure

Scenario: #40 - Aluminum, Steel or concrete toe wall retrofitting

Scenario Description:

A previously built grade stabilization structure (beyond it's design life such as a CCC structure) to prevent the advancement of gullies has been flanked or undermined and soil erosion has redeveloped. The work solves a soil erosion-concentrated flow erosion and water quality degradation resource concerns. Disturbed areas are protected with permanent vegetative cover. Typical structure retrofitted is a toe wall structure with a drop of 3ft and weir length of 30ft.

Before Situation:

The site has gullies forming and worsening around the structure and impacting the downstream water quality. Erosion from the gullies is allowing soil and nutrients to be transported to downstream receiving waters degrading water quality. Lack of operation and maintenance did not cause the failure and the rehabilitation is beyond normal operation and maintenance expected of the landowner.

After Situation:

The advancement and formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation is decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). The rehabilitated structure meets current CPS standards and the area is stabilized.

Feature Measure: Structure retrofitted

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $7,809.43

Scenario Cost/Unit: $7,809.43

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formless, non reinforced	36	Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$220.05	5	$1,100.25
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	12	$939.60
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	16	$2,088.16
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	28	$803.88
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	28	$1,123.64
Materials						
Rock Riprap, graded, angular, material and shipping	1200	Graded Rock Riprap for all gradation ranges. Includes materials and local delivery within 20 miles of quarry. Placement costs are not included.	Ton	$37.44	6	$224.64
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 410 - Grade Stabilization Structure

Scenario: #47 - Weir drop structure over 4' drop

Scenario Description:

A Straight, semicircular, or Box Drop structure composed of metal or reinforced concrete used to stabilized the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a semicircular aluminum toe wall structure with a drop of 5 ft and weir length of 27 ft (135 square feet). The unit of payment measurement is defined as weir length times drop in 'feet'. The drop (feet) is defined as the structure inlet crest elevation minus the control outlet elevation (ie: outlet apron elevation).Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Before Situation:

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

After Situation:

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Channel Bed Stabilization (584), Dike (356), Grassed Waterway (412), Structure for Water Control (587), Subsurface Drain (606), and Underground Outlet (620) will use the corresponding Standard(s) as appropriate.

Feature Measure: Feet of Weir length times Drop Hei

Scenario Unit: Square Feet

Scenario Typical Size: 135.00

Scenario Total Cost: $49,187.55

Scenario Cost/Unit: $364.35

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	6	$3,007.50
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	5	$2,835.40
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	300	$1,875.00
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	40	$3,132.00
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	40	$5,220.40
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	10	$438.70
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	80	$3,210.40
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement.	Cubic Yards	$136.88	63	$8,623.44
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	7	$202.02
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	19	$576.84
Geotextile, non-woven, heavy weight	1210	Non-woven greater than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	$1.89	62	$117.18
Anchor, earthen, low disturbance, large	2184	Low disturbance, galvanized or aluminum alloy earthen anchors with holding power greather than 3,000 pounds in normal soil. Materials and shipping only.	Each	$59.59	6	$357.54

Toe wall drop structure, prefabricated, >=5 foot drop, fixed cost portion	2804	Prefabricated aluminum toe wall drop structure, fixed cost portion. Includes structure, hardware and wales as necessary for drop greater than or equal to 5 foot. Includes materials and shipping only.	Number	$14,970.00	1	$14,970.00
Toe wall drop structure, prefabricated, >=5 foot drop, variable cost portion	2805	Prefabricated aluminum toe wall drop structure, variable cost portion. Includes structure, hardware and wales as necessary for drop greater than or equal to 5 foot. Includes materials and shipping only.	Square Feet	$18.95	135	$2,558.25
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 410 - Grade Stabilization Structure

Scenario: #48 - Articulating Concrete Block Mat Chute with Drainage System

Scenario Description:

A chute structure constructed of articulated concrete block mat. These structures are used to stabilized the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Typical is a channel area that is 12 feet wide and 60 feet in length (720 square feet). The chute has with 2:1 side slope in the inlet channel, chute and outlet channel and is an average of 2' deep, the total width of the block chute is 20' wide. The payment measurement is defined as the square footage of the chute channel including inlet and outlet sections. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Before Situation:

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

After Situation:

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Channel Bed Stabilization (584), Dike (356), Grassed Waterway (412), Structure for Water Control (587), Subsurface Drain (606), and Underground Outlet (620) will use the corresponding Standard(s) as appropriate.

Feature Measure: chute channel including inlet and o

Scenario Unit: Square Feet

Scenario Typical Size: 720.00

Scenario Total Cost: $23,810.58

Scenario Cost/Unit: $33.07

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	2	$1,134.16
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	10	$783.00
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	10	$1,305.10
Crane, truck mounted, hydraulic, 80 ton	2569	80 ton capacity truck mounted hydraulic crane. Equipment cost only.	Hours	$349.47	8	$2,795.76
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	16	$459.36
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	28	$1,123.64
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	23	$663.78
Geotextile, non-woven, heavy weight	1210	Non-woven greater than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	$1.89	147	$277.83
Geonet	1778	Geosynthetic drainage liner, typically HDPE of 300 mil thickness. Includes materials and shipping only.	Square Yard	$9.86	147	$1,449.42
Articulated precast concrete block	1906	Articulated precast concrete blocks with a typical thickness of 4.5 to 6 inches. Includes materials and shipping.	Square Feet	$9.32	1200	$11,184.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 410 - Grade Stabilization Structure

Scenario: #49 - Box Inlet Drop Structure with a Chute Spillway replacement

Scenario Description:

A Box Inlet Drop Structure with a Chute Spillway and SAF (Saint Anthony Falls) Outlet composed of reinforced concrete used to stabilized the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. This scenario is based upon a structure designed per NEH-14 and Ag Handbook 301. The structure is designed to pass the 50-year storm through the spillway and has a capacity of 300cfs with a total vertical drop of 22.5ft, with a weir width of 8' and a length of 8'; the total length of weir is 24'. The outlet channel has an inlet length of 24', a chute length of 52' and an outlet of 10', totaling a 86' total length. The unit of payment measurement is defined as weir length (feet) times the structure length in 'feet' equaling sq ft. The structure length (feet) is defined as length of the inlet channel, the chute and the outlet channel. It does not include the length weir box. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Before Situation:

The site has a concrete drop structure with an earthen embankment (typically constructed by the Civilian Conservation Corps in the early 1900's). The structure has exceeded its design life and can no longer safely meet it's intended function. This may mean the embankment is compromised, and/or a deterioration of the concrete structure which is causing concern of its safety to humans, animals and the natural resources.

After Situation:

The old structure is removed and replaced with a new structure as described by this scenario. The site has been restored to meet the intended function of the original structure. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Channel Bed Stabilization (584), Dike (356), Grassed Waterway (412), Structure for Water Control (587), Subsurface Drain (606), Underground Outlet (620), Obstruction Removal (500), Mulching (484), and Spoil Disposal (572) will use the corresponding Standard(s) as appropriate.

Feature Measure: Feet of Weir length times total stru

Scenario Unit: Square Feet

Scenario Typical Size: 2,064.00

Scenario Total Cost: $180,217.65

Scenario Cost/Unit: $87.31

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	104	$58,976.32
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	4426	$17,748.26
Dozer, 200 HP	928	Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included.	Hours	$182.87	56	$10,240.72
Water management, Flooding & dewatering	969	Includes equipment and power unit. Labor not included.	Acre Feet	$295.73	60	$17,743.80
Truck, Concrete Pump	1211	Concrete pump, normally truck mounted. Use this item in association with other concrete components when job requires placement by other than normal chutes. Include drive and setup time in quantity; therefore, do not include mobilization. Includes equipment and operator.	Hours	$158.51	40	$6,340.40
Excavation, clay, large equipment, 150 ft	1219	Bulk excavation of clay with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yards	$6.16	267	$1,644.72
Rotary Drill Rig	1595	Rotary drill rig including equipment and power unit costs. Labor not included.	Hours	$353.09	16	$5,649.44
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	176	$7,721.12
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	88	$2,526.48
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	72	$2,889.36
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement.	Cubic Yards	$136.88	23	$3,148.24

Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	113	$3,261.18
Pump, > 5 HP to 30 HP, pump and motor, fixed cost portion	1011	Fixed cost portion of a pump between 5 and 30 HP, including the pump and motor. This portion is a base cost for the pump and is not dependent on horsepower. The total cost will include this fixed cost plus a variable cost portion. Includes material and shipping only.	Each	$3,727.95	4	$14,911.80
Pump, > 5 HP to 30 HP, pump and motor, variable cost portion	1012	Variable cost portion of a pump between 5 and 30 HP, including the pump and motor. This portion is dependent on the total horsepower for the pump. The total cost will include this variable cost plus a fixed cost portion. Includes material and shipping only.	Horsepower	$252.77	40	$10,110.80
Geotextile, non-woven, heavy weight	1210	Non-woven greater than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	$1.89	297	$561.33
Erosion Control Blanket, biodegradable	1213	Biodegradable erosion control blanket, typically a composite of natural fibers with reinforcing polymer netting. Materials and shipping only.	Square Yard	$1.65	3843	$6,340.95
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.29	787.6	$1,803.60
Pipe, smooth steel, weight priced	1325	Smooth Steel pipe priced by the weight of the pipe materials. Materials only.	Pound	$3.47	417.3	$1,448.03
Steel, Angle, 2 1/2 in. x 2 1/2 in. x 1/4 in.	1372	Materials: Angle, 2 1/2 inch x 2 1/2 inch x 1/4 inch. Meets ASTM A36	Feet	$4.19	93	$389.67
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	1200	$1,200.00
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	3	$546.24
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	2	$1,846.38
Aggregate, Shipping, Cubic Yard-mile	2360	Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul).	Cubic Yard Mile	$0.42	3180	$1,335.60

Practice: 410 - Grade Stabilization Structure

Scenario: #50 - Weir drop structure 4' and less drop

Scenario Description:

A Straight, semicircular, or Box Drop structure composed of metal or reinforced concrete used to stabilized the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a semicircular aluminum toe wall structure with a drop of 3 ft and weir length of 27 ft (81 square feet). The unit of payment measurement is defined as weir length times drop in 'feet'. The drop (feet) is defined as the structure inlet crest elevation minus the control outlet elevation (ie: outlet apron elevation).Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Before Situation:

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

After Situation:

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Channel Bed Stabilization (584), Dike (356), Grassed Waterway (412), Structure for Water Control (587), Subsurface Drain (606), and Underground Outlet (620) will use the corresponding Standard(s) as appropriate.

Feature Measure: Feet of Weir length times Drop Hei

Scenario Unit: Square Feet

Scenario Typical Size: 81.00

Scenario Total Cost: $30,748.35

Scenario Cost/Unit: $379.61

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	5	$2,506.25
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	3	$1,701.24
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	250	$1,562.50
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	32	$2,505.60
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	32	$4,176.32
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	10	$438.70
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	64	$2,568.32
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement.	Cubic Yards	$136.88	48	$6,570.24
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	6	$173.16
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	8	$242.88
Geotextile, non-woven, heavy weight	1210	Non-woven greater than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	$1.89	62	$117.18
Toe wall drop structure, prefabricated, <5 foot drop, fixed cost portion	2802	Prefabricated aluminum toe wall drop structure, fixed cost portion. Includes structure, hardware and wales as necessary for drop less than 5 foot. Includes materials and shipping only.	Number	$3,881.00	1	$3,881.00

Toe wall drop structure, prefabricated, <5 foot drop, variable cost portion	2803	Prefabricated aluminum toe wall drop structure, variable cost portion. Includes structure, hardware and wales as necessary for drop less than 5 foot. Includes materials and shipping only.	Square Feet	$27.68	81	$2,242.08
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 410 - Grade Stabilization Structure

Scenario: #98 - Embankment, Pipe <= 6 inch

Scenario Description:

An earthen embankment dam with a principal spillway pipe of 6 inches or less. Assessment shows anti-seep collars or sand diaphragms are not required. To stabilized the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a typical amount of earthfill of 2,000 cubic yards, and 80 feet of pipe 6' PVC pipe with a canopy inlet. A small, non-lined plunge pool protects the outlet channel. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Before Situation:

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

After Situation:

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Pumping Plant (533), Watering Facility (614), and Livestock Pipeline (516) will use the corresponding Standard(s) as appropriate.

Feature Measure: Cubic Yards of Earthfill

Scenario Unit: Cubic Yards

Scenario Typical Size: 2,000.00

Scenario Total Cost: $12,347.82

Scenario Cost/Unit: $6.17

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	2000	$8,020.00
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	20	$125.00
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	5	$652.55
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	20	$877.40
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	10	$287.10
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	5	$200.65
Materials						
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.29	286.4	$655.86
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 410 - Grade Stabilization Structure

Scenario: #99 - Embankment, Pipe 8-12 inch

Scenario Description:

An earthen embankment dam with a principle spillway pipe between 8 and 12 inches, anti-seep collars or sand diaphragm, and excavated plunge pool basin. Installed to stabilized the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a typical amount of earthfill of 2,500 cubic yards, 90 feet of 10' pace, pipe with a canopy inlet, and 3 cubic yard sand diaphragm. A non-lined plunge pool protects the outlet channel. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Before Situation:

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

After Situation:

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Pumping Plant (533), Watering Facility (614), and Livestock Pipeline (516) will use the corresponding Standard(s) as appropriate.

Feature Measure: Cubic Yards of Earthfill

Scenario Unit: Cubic Yards

Scenario Typical Size: 2,500.00

Scenario Total Cost: $18,482.54

Scenario Cost/Unit: $7.39

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	2500	$10,025.00
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	29	$181.25
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	10	$1,305.10
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	30	$1,316.10
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	30	$861.30
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	10	$401.30
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	3	$86.58
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.29	1133	$2,594.57
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 410 - Grade Stabilization Structure

Scenario: #100 - Embankment, Pipe >12 inch

Scenario Description:

An earthen embankment dam with a principle spillway pipe greater than 12 inches. Installed to stabilized the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a typical amount of earthfill of 2,500 cubic yards, smooth steel drop inlet principle spillway with a 7 ft riser and 90 ft barrel, and 82 Square feet of anti-seep collars. A rock lined plunge pool protects the outlet channel. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Before Situation:

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

After Situation:

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Pumping Plant (533), Watering Facility (614), and Livestock Pipeline (516) will use the corresponding Standard(s) as appropriate.

Feature Measure: Cubic Yards of Earthfill

Scenario Unit: Cubic Yards

Scenario Typical Size: 2,500.00

Scenario Total Cost: $26,276.40

Scenario Cost/Unit: $10.51

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formless, non reinforced	36	Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$220.05	1	$220.05
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	2	$1,134.16
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	2500	$10,025.00
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	129	$806.25
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	13	$1,696.63
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	38	$1,667.06
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	42	$1,205.82
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	13	$521.69
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement.	Cubic Yards	$136.88	14	$1,916.32
Dimension Lumber, Treated	1044	Treated dimension lumber with nominal thickness equal or less than 2 inches. Includes lumber and fasteners	Board Feet	$1.79	30	$53.70
Steel, Plate, 1/8 in.	1047	Flat Steel Plate, 1/8 inch thick, materials only.	Square Feet	$7.51	82	$615.82
Pipe, Steel, Std Wt., Used, weight priced	2870	Schedule 40 steel pipe, used. Materials only.	Pound	$0.96	4898.5	$4,702.56
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 410 - Grade Stabilization Structure

Scenario: #101 - Embankment, Soil Treatment

Scenario Description:

An earthen embankment dam with a principal spillway pipe where on site soils are not acceptable and require extra processing or hauling from off farm, distances greater than one mile. Installed to stabilized the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a typical amount of earthfill of 2,500 cubic yards, 90 feet of 10' pace, pipe with a canopy inlet, and 3 cubic yard sand diaphragm. A non-lined plunge pool protects the outlet channel. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Before Situation:

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

After Situation:

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Pumping Plant (533), Watering Facility (614), and Livestock Pipeline (516) will use the corresponding Standard(s) as appropriate.

Feature Measure: Cubic Yards of Earthfill

Scenario Unit: Cubic Yards

Scenario Typical Size: 2,500.00

Scenario Total Cost: $27,482.54

Scenario Cost/Unit: $10.99

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	2500	$10,025.00
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	29	$181.25
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	10	$1,305.10
Hauling, bulk, highway truck	1615	Hauling of bulk earthfill, rockfill, waste or debris. One-way travel distance using fully loaded highway dump trucks (typically 16 CY or 20 TN capacity). Includes equipment and labor for truck only. Does not include cost for loading truck.	Cubic Yard Mile	$0.36	25000	$9,000.00
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	30	$1,316.10
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	30	$861.30
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	10	$401.30
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	3	$86.58
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.29	1133	$2,594.57
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 410 - Grade Stabilization Structure

Scenario: #102 - Pipe Drop, Plastic

Scenario Description:

A full flow pipe drop (ie: riser and barrel) grade stabilization structure designed and constructed using plastic pipe without anti-seep collars. This is typically a earthen dry dam structure with no permanent storage (water or sediment), however some structures may have some permanent pool / storage but do not have 35 years of sediment life. Payment rate is based upon the riser weir length (Diameter x 3.14) in feet times the length of the pipe barrel in (feet). Installed to stabilized the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon 6 ft high 18' (1.5') PVC riser with a 40 ft long barrel (1.5' x 3.14 x 40' = 188 SF). Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Before Situation:

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

After Situation:

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Channel Bed Stabilization (584), Dike (356), Grassed Waterway (412), Structure for Water Control (587), and Irrigation Canal or Lateral (320) will use the corresponding Standard(s) as appropriate.

Feature Measure: Riser Weir Length x Barrel Length

Scenario Unit: Square Feet

Scenario Typical Size: 188.00

Scenario Total Cost: $9,865.76

Scenario Cost/Unit: $52.48

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	1	$567.08
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	100	$401.00
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	20	$125.00
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	2	$261.02
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	2	$80.26
Materials						
Coupling, PVC, Tee, 24x18, SCH 40	1374	Materials: - Tee, 24 x 18 inch - PVC - SCH 40 - ASTM D1785	Each	$4,729.09	1	$4,729.09
Pipe, PVC, dia. => 18 in., weight priced	1958	Polyvinyl Chloride (PVC) Pipe priced by the weight of the pipe materials for pipes with diameters equal to or greater than 18 inch. Materials only.	Pound	$2.41	1048.1	$2,525.92
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 410 - Grade Stabilization Structure

Scenario: #103 - Pipe Drop, Steel

Scenario Description:

A full flow pipe drop (ie: riser and barrel) grade stabilization structure designed and constructed with a metal anti-seep collar. This is typically a earthen dry dam structure with no permanent storage (water or sediment), however some structures may have some permanent pool / storage but do not have 35 years of sediment life. Payment rate is based upon the riser weir length (Diameter x 3.14) in feet times the length of the pipe barrel in (feet). Installed to stabilized the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a smooth steel pipe drop structure with a 36', 12' tall riser and a 100' long 30' barrel (Riser Weir length x Barrel Length = 3ft x 3.14 x 30ft = 940). Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Before Situation:

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

After Situation:

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Channel Bed Stabilization (584), Dike (356), Grassed Waterway (412), Structure for Water Control (587), and Irrigation Canal or Lateral (320) will use the corresponding Standard(s) as appropriate.

Feature Measure: Riser Weir Length x Barrel Length

Scenario Unit: Square Feet

Scenario Typical Size: 940.00

Scenario Total Cost: $19,656.57

Scenario Cost/Unit: $20.91

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	600	$2,406.00
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	100	$625.00
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	4	$522.04
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	11	$482.57
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	10	$287.10
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	4	$160.52
Materials						
Steel, Plate, 1/8 in.	1047	Flat Steel Plate, 1/8 inch thick, materials only.	Square Feet	$7.51	30	$225.30
Steel, Plate, 3/8 in.	1375	Flat steel plate, 3/8 inch thickness. Materials only.	Square Feet	$22.51	9	$202.59
Pipe, Steel, Std Wt., Used, weight priced	2870	Schedule 40 steel pipe, used. Materials only.	Pound	$0.96	13577.2	$13,034.11
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 410 - Grade Stabilization Structure

Scenario: #104 - Weir Drop Structures

Scenario Description:

A Straight, semicircular, or Box Drop structure composed of metal or reinforced concrete used to stabilized the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a semicircular steel toe wall structure with a drop of 3ft and weir length of 30ft (90 square feet). The unit of payment measurement is defined as weir length times drop in 'feet'. The drop (feet) is defined as the structure inlet crest elevation minus the control outlet elevation (ie: outlet apron elevation).Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Before Situation:

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

After Situation:

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Channel Bed Stabilization (584), Dike (356), Grassed Waterway (412), Structure for Water Control (587), Subsurface Drain (606), and Underground Outlet (620) will use the corresponding Standard(s) as appropriate.

Feature Measure: Feet of Weir length times Drop Hei

Scenario Unit: Square Feet

Scenario Typical Size: 90.00

Scenario Total Cost: $13,649.20

Scenario Cost/Unit: $151.66

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	9	$5,103.72
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.11	9	$9.99
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	40	$100.80
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	75	$300.75
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	5	$652.55
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	10	$438.70
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	30	$861.30
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	5	$200.65
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	3	$91.08
Rock Riprap, graded, angular, material and shipping	1200	Graded Rock Riprap for all gradation ranges. Includes materials and local delivery within 20 miles of quarry. Placement costs are not included.	Ton	$37.44	11	$411.84
Corrugated Steel, 12 Gauge, galvanized	1376	Corrugated Steel, 12 gauge, 3 inch by 1 inch corrugations, galvanized, meets ASTM A 929. Materials only.	Square Feet	$18.52	212	$3,926.24
Pipe, CMP, 14-12 gauge, weight priced	1589	14 and 12 gauge galvanized helical corrugated metal pipe priced by the weight of the pipe materials. Materials only.	Pound	$0.93	24	$22.32
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 410 - Grade Stabilization Structure

Scenario: #105 - Rock Drop Structures

Scenario Description:

A Straight Drop structure constructed of rock riprap held in place by galvanized wire, such as, gabion baskets, fence panels, or 'sausage' baskets. These structures are used to stabilized the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a gabion wall structure with a drop of 3ft and weir length of 8ft (48 square feet). The unit of payment measurement is defined as weir length times drop in 'feet'. The drop (feet) is defined as the structure inlet crest elevation minus the control outlet elevation (ie: outlet apron elevation).Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Before Situation:

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

After Situation:

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Channel Bed Stabilization (584), Dike (356), Grassed Waterway (412), Structure for Water Control (587), Subsurface Drain (606), and Underground Outlet (620) will use the corresponding Standard(s) as appropriate.

Feature Measure: Feet of Weir length times Drop Hei

Scenario Unit: Square Feet

Scenario Typical Size: 48.00

Scenario Total Cost: $5,194.66

Scenario Cost/Unit: $108.22

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.11	23	$25.53
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	7	$17.64
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	40	$160.40
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	5	$652.55
Tractor, agricultural, 210 HP	1201	Agricultural tractor with horsepower range of 190 to 240. Equipment and power unit costs. Labor not included.	Hours	$133.30	3	$399.90
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	10	$287.10
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	5	$200.65
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	10	$486.00
Materials						
Gabion basket or mat	1378	Gabion baskets or mats installed and filled on grade, includes materials, transport, equipment, and labor, does not include geotextile fabric.	Cubic Yards	$205.09	7	$1,435.63
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 412 - Grassed Waterway

Scenario: #2 - Waterway DA less than 200 acres

Scenario Description:

Typical practice has a watershed less than 200 acres and is 1000 ' long, 25' bottom, 8:1 side slopes, 1.5' depth, half excavation. A grass waterway that is a shaped or graded channel and is established with suitable vegetation to carry surface water at a non-erosive velocity to a stable outlet. This practice addresses Concentrated Flow Erosion (Classic Gully & Ephemeral Erosion) and Excessive Sediment in surface waters. Seeding area is 20% greater than waterway area to account for disturbed areas. Costs include excavation and associated work to construct the overall shape and grade of the waterway and seeding after construction.

Before Situation:

The field has a small gulley which is cutting deeper into the field as time goes on, so it needs to be stopped or controlled. Excessive sedimentation and soil erosion as a result from ephemeral or classic gully erosion. Gully has formed in field as a result of excessive runoff and poor cropping techniques. Grassed waterway is also commonly installed to covey runoff from concentrated flows, terraces, diversions, or water control structures or similar practices to a suitable, stable outlet.

After Situation:

Installed grassed waterway is 1000 ' long, 25' bottom, 8:1 side slopes, 1.5' depth. The practice is installed using a dozer. If erosion control blankets or mulching for seedbed establishment/protection are needed, use conservation practice Mulching (484). If temporary berms are needed to establish the seeding, use conservation practice Spoil Spreading (572) for berm removal. Building the berms is assumed to be equal cost to spreading the spoil if no berms were built. Drainage tile, if needed, will be installed according to Subsurface Drain (606). Outlets, if needed will be installed using Grade Stabilization Structure (410). If inlet Structures are needed with the drainage tile, then those will be installed using Underground Outlet (620).

Feature Measure: Linear feet of waterway

Scenario Unit: Feet

Scenario Typical Size: 1,000.00

Scenario Total Cost: $4,960.45

Scenario Cost/Unit: $4.96

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$100.26	20	$2,005.20
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	1.35	$20.09
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.61	1.35	$10.27
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	1.35	$30.06
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$10.18	1.35	$13.74
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yards	$0.87	907	$789.09
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	20	$802.60
Materials						
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	81	$55.08
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.81	81	$65.61
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	81	$55.08
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$26.18	2.7	$70.69
Introduced Perennial Grasses, Legumes and/or Forbs, High Density	2749	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping.	Acres	$88.70	1.35	$119.75
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 412 - Grassed Waterway

Scenario: #3 - Waterway DA between 200 and 600 acres

Scenario Description:

Typical practice has a drainage area between 200 and 600 acres and is 1200 ' long, 30' bottom, 8:1 side slopes, 1.8' depth, half excavation. A grass waterway that is a shaped or graded channel and is established with suitable vegetation to carry surface water at a non-erosive velocity to a stable outlet. This practice addresses Concentrated Flow Erosion (Classic Gully & Ephemeral Erosion) and Excessive Sediment in surface waters. Seeding area is 20% greater than waterway area to account for disturbed areas. Costs include excavation and associated work to construct the overall shape and grade of the waterway and seeding after construction.

Before Situation:

The field has a small gulley which is cutting deeper into the field as time goes on, so it needs to be stopped or controlled. Excessive sedimentation and soil erosion as a result from ephemeral or classic gully erosion. Gully has formed in field as a result of excessive runoff and poor cropping techniques. Grassed waterway is also commonly installed to covey runoff from concentrated flows, terraces, diversions, or water control structures or similar practices to a suitable, stable outlet.

After Situation:

Installed grassed waterway is 1200 ' long, 30' bottom, 8:1 side slopes, 1.8' depth. The practice is installed using a dozer. If erosion control blankets or mulching for seedbed establishment/protection are needed, use conservation practice Mulching (484). If temporary berms are needed to establish the seeding, use conservation practice Spoil Spreading (572) for berm removal. Building the berms is assumed to be equal cost to spreading the spoil if no berms were built. Drainage tile, if needed, will be installed according to Subsurface Drain (606). Outlets, if needed will be installed using Grade Stabilization Structure (410). If inlet Structures are needed with the drainage tile, then those will be installed using Underground Outlet (620).

Feature Measure: Linear feet of waterway

Scenario Unit: Feet

Scenario Typical Size: 1,200.00

Scenario Total Cost: $6,209.60

Scenario Cost/Unit: $5.17

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$100.26	25	$2,506.50
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	1.95	$29.02
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.61	1.95	$14.84
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	1.95	$43.43
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$10.18	1.95	$19.85
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yards	$0.87	1311	$1,140.57
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	25	$1,003.25
Materials						
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	117	$79.56
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.81	117	$94.77
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	117	$79.56
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$26.18	3.9	$102.10
Introduced Perennial Grasses, Legumes and/or Forbs, High Density	2749	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping.	Acres	$88.70	1.95	$172.97
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 412 - Grassed Waterway

Scenario: #4 - Waterway DA greater than 600 acre

Scenario Description:

Typical practice has a drainage area greater than 600 acres and is 1500 ' long, 40' bottom, 8:1 side slopes, 2' depth, three quarters excavation. A grass waterway that is a shaped or graded channel and is established with suitable vegetation to carry surface water at a non-erosive velocity to a stable outlet. This practice addresses Concentrated Flow Erosion (Classic Gully & Ephemeral Erosion) and Excessive Sediment in surface waters. Seeding area is 20% greater than waterway area to account for disturbed areas. Costs include excavation and associated work to construct the overall shape and grade of the waterway and seeding after construction. Major grading accomplished with a grader or scraper followed up by a dozer.

Before Situation:

The field has a small gulley which is cutting deeper into the field as time goes on, so it needs to be stopped or controlled. Excessive sedimentation and soil erosion as a result from ephemeral or classic gully erosion. Gully has formed in field as a result of excessive runoff and poor cropping techniques. Grassed waterway is also commonly installed to covey runoff from concentrated flows, terraces, diversions, or water control structures or similar practices to a suitable, stable outlet.

After Situation:

Installed grassed waterway is 1500 ' long, 40' bottom, 8:1 side slopes, 2.0' depth. The practice is installed using a dozer. If erosion control blankets or mulching for seedbed establishment/protection are needed, use conservation practice Mulching (484). If temporary berms are needed to establish the seeding, use conservation practice Spoil Spreading (572) for berm removal. Building the berms is assumed to be equal cost to spreading the spoil if no berms were built. Drainage tile, if needed, will be installed according to Subsurface Drain (606). Outlets, if needed will be installed using Grade Stabilization Structure (410). If inlet Structures are needed with the drainage tile, then those will be installed using Underground Outlet (620).

Feature Measure: Linear feet of waterway

Scenario Unit: Feet

Scenario Typical Size: 1,500.00

Scenario Total Cost: $14,884.23

Scenario Cost/Unit: $9.92

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$100.26	40	$4,010.40
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	2.98	$44.34
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.61	2.98	$22.68
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	2.98	$66.36
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$10.18	2.98	$30.34
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yards	$0.87	2000	$1,740.00
Scraper, self propelled, 21 CY	1208	Self propelled earthmoving scraper with 21 CY capacity. Does not include labor.	Hours	$296.28	14	$4,147.92
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	54	$2,167.02
Materials						
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	179	$121.72
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.81	179	$144.99
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	179	$121.72
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$26.18	5.96	$156.03
Introduced Perennial Grasses, Legumes and/or Forbs, High Density	2749	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping.	Acres	$88.70	2.98	$264.33
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	2	$1,846.38

Practice: 412 - Grassed Waterway

Scenario: #5 - Grassed Waterway with checks less than 200 ac drainage area

Scenario Description:

Typical practice is 1000 ' long, 25' bottom, 8:1 side slopes, 1.5' depth, half excavation. A grass waterway that is a shaped or graded channel and is established with suitable vegetation to carry surface water at a non-erosive velocity to a stable outlet. Fabric or stone checks are installed every 100 feet along the length of the waterway perpendicular to waterflow and are 2/3 the waterway top width to reduce maintenance and provide temporary protection until vegetation is established. Fabric Checks are installed 18' deep with 12' laid over on the surface. (Alternatively, rock checks could be installed). This practice addresses Concentrated Flow Erosion (Classic Gully & Ephemeral Erosion) and Excessive Sediment in surface waters. Seeding area is 20% greater than waterway area to account for disturbed areas. Costs include excavation and associated work to construct the overall shape and grade of the waterway and seeding after construction.

Before Situation:

The field has a small gulley which is cutting deeper into the field as time goes on, so it needs to be stopped or controlled. Excessive sedimentation and soil erosion as a result from ephemeral or classic gully erosion. Gully has formed in field as a result of excessive runoff and poor cropping techniques. Grassed waterway is also commonly installed to covey runoff from concentrated flows, terraces, diversions, or water control structures or similar practices to a suitable, stable outlet.

After Situation:

Installed grassed waterway is 1000 ' long, 25' bottom, 8:1 side slopes, 1.5' depth. Fabric checks are installed every 100 feet along the length of the waterway. The practice is installed using a dozer. Fabric or stone checks are installed with small backhoe and labor. If erosion control blankets or mulching for seedbed establishment/protection are needed, use conservation practice Mulching (484). Drainage tile, if needed, will be installed according to Subsurface Drain (606). Outlets, if needed will be installed using Structure for Water Control (587). If inlet Structures are needed with the drainage tile, then those will be installed using Underground Outlet (620).

Feature Measure: Linear feet of waterway

Scenario Unit: Feet

Scenario Typical Size: 1,000.00

Scenario Total Cost: $7,799.14

Scenario Cost/Unit: $7.80

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.45	23	$79.35
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$100.26	20	$2,005.20
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	1.35	$20.09
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.61	1.35	$10.27
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	1.35	$30.06
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$10.18	1.35	$13.74
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yards	$0.87	907	$789.09
Excavation, common earth, large equipment, 50 ft	1222	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yards	$1.56	1482	$2,311.92
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	4	$114.84
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	20	$802.60
Materials						
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	81	$55.08
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.81	81	$65.61
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	81	$55.08
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$26.18	2.7	$70.69
Geotextile, non-woven, light weight	1209	Non-woven less than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	$2.08	90	$187.20

Introduced Perennial Grasses, Legumes and/or Forbs, High Density	2749	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping.	Acres	$88.70	1.35	$119.75
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 412 - Grassed Waterway

Scenario: #6 - Grassed Waterway with checks between 200 and 600 ac drainage area

Scenario Description:

Typical practice has a drainage area between 200 and 600 acres and is 1200 ' long, 30' bottom, 8:1 side slopes, 1.8' depth, half excavation. A grass waterway that is a shaped or graded channel and is established with suitable vegetation to carry surface water at a non-erosive velocity to a stable outlet. Fabric or stone checks are installed every 100 feet along the length of the waterway perpendicular to waterflow and are 2/3 the waterway top width to reduce maintenance and provide temporary protection until vegetation is established. Fabric Checks are installed 18' deep with 12' laid over on the surface. (Alternatively, rock checks could be installed). This practice addresses Concentrated Flow Erosion (Classic Gully & Ephemeral Erosion) and Excessive Sediment in surface waters. Seeding area is 20% greater than waterway area to account for disturbed areas. Costs include excavation and associated work to construct the overall shape and grade of the waterway and seeding after construction.

Before Situation:

The field has a small gulley which is cutting deeper into the field as time goes on, so it needs to be stopped or controlled. Excessive sedimentation and soil erosion as a result from ephemeral or classic gully erosion. Gully has formed in field as a result of excessive runoff and poor cropping techniques. Grassed waterway is also commonly installed to covey runoff from concentrated flows, terraces, diversions, or water control structures or similar practices to a suitable, stable outlet.

After Situation:

Installed grassed waterway is 1200 ' long, 30' bottom, 8:1 side slopes, 1.8' depth. Fabric checks are installed every 100 feet along the length of the waterway. The practice is installed using a dozer. Fabric or stone checks are installed with small backhoe and labor. If erosion control blankets or mulching for seedbed establishment/protection are needed, use conservation practice Mulching (484). Drainage tile, if needed, will be installed according to Subsurface Drain (606). Outlets, if needed will be installed using Structure for Water Control (587). If inlet Structures are needed with the drainage tile, then those will be installed using Underground Outlet (620).

Feature Measure: Linear feet of waterway

Scenario Unit: Feet

Scenario Typical Size: 1,200.00

Scenario Total Cost: $10,751.12

Scenario Cost/Unit: $8.96

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.45	36	$124.20
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$100.26	25	$2,506.50
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	1.95	$29.02
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.61	1.95	$14.84
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	1.95	$43.43
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$10.18	1.95	$19.85
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yards	$0.87	1311	$1,140.57
Excavation, common earth, large equipment, 50 ft	1222	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yards	$1.56	2436	$3,800.16
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	6	$172.26
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	25	$1,003.25
Materials						
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	117	$79.56
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.81	117	$94.77
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	117	$79.56
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$26.18	3.9	$102.10
Geotextile, non-woven, light weight	1209	Non-woven less than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	$2.08	144	$299.52

Introduced Perennial Grasses, Legumes and/or Forbs, High Density	2749	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping.	Acres	$88.70	1.95	$172.97
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 412 - Grassed Waterway

Scenario: #7 - Grassed Waterway with checks greater than 600 ac drainage area

Scenario Description:

Typical practice is 1500 ' long, 40' bottom, 8:1 side slopes, 2.0' depth, three quarter excavation. A grass waterway that is a shaped or graded channel and is established with suitable vegetation to carry surface water at a non-erosive velocity to a stable outlet. Major grading accomplished with a grader or scraper followed up by a dozer. Fabric or stone checks are installed every 100 feet along the length of the waterway perpendicular to waterflow and are 2/3 the waterway top width to reduce maintenance and provide temporary protection until vegetation is established. Fabric Checks are installed 18' deep with 12' laid over on the surface. (Alternatively, rock checks could be installed). This practice addresses Concentrated Flow Erosion (Classic Gully & Ephemeral Erosion) and Excessive Sediment in surface waters. Seeding area is 20% greater than waterway area to account for disturbed areas. Costs include excavation and associated work to construct the overall shape and grade of the waterway and seeding after construction.

Before Situation:

The field has a small gulley which is cutting deeper into the field as time goes on, so it needs to be stopped or controlled. Excessive sedimentation and soil erosion as a result from ephemeral or classic gully erosion. Gully has formed in field as a result of excessive runoff and poor cropping techniques. Grassed waterway is also commonly installed to covey runoff from concentrated flows, terraces, diversions, or water control structures or similar practices to a suitable, stable outlet.

After Situation:

Installed grassed waterway is 1500 ' long, 40' bottom, 8:1 side slopes, 2.0' depth. Fabric checks are installed every 100 feet along the length of the waterway. The practice is installed using a dozer. Fabric or stone checks are installed with small backhoe and labor. . If erosion control blankets or mulching for seedbed establishment/protection are needed, use conservation practice Mulching (484). Drainage tile, if needed, will be installed according to Subsurface Drain (606). Outlets, if needed will be installed using Structure for Water Control (587). If inlet Structures are needed with the drainage tile, then those will be installed using Underground Outlet (620).

Feature Measure: Linear feet of waterway

Scenario Unit: Feet

Scenario Typical Size: 1,500.00

Scenario Total Cost: $25,671.78

Scenario Cost/Unit: $17.11

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.45	60	$207.00
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$100.26	40	$4,010.40
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	2.98	$44.34
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.61	2.98	$22.68
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	2.98	$66.36
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$10.18	2.98	$30.34
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yards	$0.87	2000	$1,740.00
Scraper, self propelled, 21 CY	1208	Self propelled earthmoving scraper with 21 CY capacity. Does not include labor.	Hours	$296.28	14	$4,147.92
Excavation, common earth, large equipment, 50 ft	1222	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yards	$1.56	5667	$8,840.52
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	6	$172.26
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	54	$2,167.02
Materials						
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	179	$121.72
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.81	179	$144.99
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	179	$121.72

Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$26.18	5.96	$156.03
Geotextile, non-woven, light weight	1209	Non-woven less than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	$2.08	240	$499.20
Introduced Perennial Grasses, Legumes and/or Forbs, High Density	2749	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping.	Acres	$88.70	2.98	$264.33
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	2	$1,846.38

Practice: 412 - Grassed Waterway

Scenario: #36 - Base Waterway

Scenario Description:

Typical practice is 1200 ' long, 12' bottom, 8:1 side slopes, 1.5' depth, half excavation. A grass waterway that is a shaped or graded channel and is established with suitable vegetation to carry surface water at a non-erosive velocity to a stable outlet. This practice addresses Concentrated Flow Erosion (Classic Gully & Ephemeral Erosion) and Excessive Sediment in surface waters. Waterway area measured from top of bank to top of bank. Seeding area is 20% greater than waterway area to account for disturbed areas. Costs include excavation and associated work to construct the overall shape and grade of the waterway.

Before Situation:

The field has a small gulley which is cutting deeper into the field as time goes on, so it needs to be stopped or controlled. Excessive sedimentation and soil erosion as a result from ephemeral or classic gully erosion. Gully has formed in field as a result of excessive runoff and poor cropping techniques. Grassed waterway is also commonly installed to covey runoff from concentrated flows, terrarces, diversions, or water control structures or similar practices to a suitable, stable outlet.

After Situation:

Installed grassed waterway is 1200 ' long, 12' bottom, 8:1 side slopes, 1.5' depth. The practice is installed using a dozer. If erosion control blankets or mulching for seedbed establishment/protection are needed, use conservation practice Mulching (484). Drainage tile, if needed, will be installed accoring to Subsurface Drain (606). Outlets, if needed will be installed using Structure for Water Control (587). If inlet Structures are needed with the drainage tile, then those will be installed using Underground Outlet (620).

Feature Measure: Acre of Waterway

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $2,526.51

Scenario Cost/Unit: $2,526.51

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	2	$29.76
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	2	$29.76
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.61	1	$7.61
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	1	$22.27
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$10.18	1	$10.18
Excavation, common earth, large equipment, 50 ft	1222	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yards	$1.56	800	$1,248.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	4	$114.84
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	1	$48.60
Materials						
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	30	$20.40
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.81	60	$48.60
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	60	$40.80
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$26.18	2	$52.36
Introduced Perennial Grasses, Legumes and/or Forbs, High Density	2749	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping.	Acres	$88.70	1	$88.70
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 412 - Grassed Waterway

Scenario: #37 - With Checks

Scenario Description:

Typical practice is 1200 ' long, 12' bottom, 8:1 side slopes, 1.5' depth, half excavation. A grass waterway that is a shaped or graded channel and is established with suitable vegetation to carry surface water at a non-erosive velocity to a stable outlet. Fabric or stone checks are installed every 100 feet along the length of the waterway perpendicular to waterflow and are 2/3 the waterway top width to reduce maintenance and provide temporary protection until vegetation is established. Fabric Checks are installed 18' deep with 12' laid over on the surface. (Alternatively, rock checks could be installed). This practice addresses Concentrated Flow Erosion (Classic Gully & Ephemeral Erosion) and Excessive Sediment in surface waters. Waterway area measured from top of bank to top of bank. Seeding area is 20% greater than waterway area to account for disturbed areas. Costs include excavation and associated work to construct the overall shape and grade of the waterway.

Before Situation:

The field has a small gulley which is cutting deeper into the field as time goes on, so it needs to be stopped or controlled. Excessive sedimentation and soil erosion as a result from ephemeral or classic gully erosion. Gully has formed in field as a result of excessive runoff and poor cropping techniques. Grassed waterway is also commonly installed to covey runoff from concentrated flows, terrarces, diversions, or water control structures or similar practices to a suitable, stable outlet.

After Situation:

Installed grassed waterway is 1200 ' long, 12' bottom, 8:1 side slopes, 1.5' depth. Fabric checks are installed every 100 feet along the length of the waterway. The practice is installed using a dozer. Fabric or stone checks are installed with small backhoe and labor. If erosion control blankets or mulching for seedbed establishment/protection are needed, use conservation practice Mulching (484). Drainage tile, if needed, will be installed accoring to Subsurface Drain (606). Outlets, if needed will be installed using Structure for Water Control (587). If inlet Structures are needed with the drainage tile, then those will be installed using Underground Outlet (620).

Feature Measure: Acre of Waterway

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $3,854.78

Scenario Cost/Unit: $3,854.78

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	33	$83.16
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	33	$206.25
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	2	$29.76
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	2	$29.76
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.61	1	$7.61
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	1	$22.27
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$10.18	1	$10.18
Excavation, common earth, large equipment, 50 ft	1222	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yards	$1.56	800	$1,248.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	12	$344.52
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	2	$97.20
Materials						
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	30	$20.40
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.81	60	$48.60
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	60	$40.80
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$26.18	2	$52.36
Geotextile, non-woven, light weight	1209	Non-woven less than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	$2.08	132	$274.56

Introduced Perennial Grasses, Legumes and/or Forbs, High Density	2749	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping.	Acres	$88.70	1	$88.70
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 420 - Wildlife Habitat Planting

Scenario: #233 - High Species Diversity on Cropland with Foregone Income

Scenario Description:

A wildlife habitat evaluation or plant community inventory indicates a potential to improve wildlife habitat by altering the current vegetation conditions (species diversity, richness, structure and pattern) and changing use (annual crop to permanent vegetation) by establishing herbaceous plants. This practice scenario applies to cropland currently in production. The inadequate wildlife habitat resource concern is met by planting a moderately diverse mix of seeds that is readily available for purchase from multiple vendors in combination with minor seed bed preparation. Seed is typically not available from traditional agricultural vendors and requires making a special order or ordering online. Weed pressure is minimal due to current and past management. Control or suppression of existing undesirable vegetation is accomplished through a single herbicide treatment. Post-planting weed treatment, beyond normal practice maintenance if necessary, will be accomplished by applying additional practice standards as appropriate.

Before Situation:

Vegetative habitat conditions (species diversity, richness, structure and pattern) do not meet planning criteria and do not have the potential to meet or exceed the minimum criteria through vegetative management activities alone. Current conditions and management are insufficient to address identified limiting habitat factor(s) or to increase planning criteria above a current planning criterion of at least 50% of the potential.

After Situation:

The land is no longer in crop production. Desired species have been planted and the Wildlife Habitat Planting criteria have been successfully implemented. As a result, the site will meet or exceed planning criteria for inadequate wildlife habitat.

Feature Measure: acres planted (per acre)

Scenario Unit: Acres

Scenario Typical Size: 5.00

Scenario Total Cost: $5,850.56

Scenario Cost/Unit: $1,170.11

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	5	$74.40
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	5	$33.65
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	5	$111.35
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$415.54	5	$2,077.70
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	4	$194.40
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$12.66	5	$63.30
Native Perennial Grasses, Legumes and/or Forb Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, moderate commercial availability	2619	Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed is moderately easy to purchase commercially. Includes materials and shipping.	Acres	$469.81	5	$2,349.05
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 420 - Wildlife Habitat Planting

Scenario: #234 - High Species Diversity on Fallow or Non-Cropland, no Foregone Income

Scenario Description:

A wildlife habitat evaluation or plant community inventory indicates a potential to improve wildlife habitat by altering the current vegetation conditions (species diversity, richness, structure and pattern) by establishing herbaceous plants. This practice scenario applies to areas not in production (e.g. ??? fallow areas, forest understory, and non-cropped areas in and around crop fields). Control or suppression of a well-established existing stand of undesirable vegetation should have been completed prior to implementation of this practice scenario through successful implementation of other practice standards, including CPS 314 or CPS 315. This scenario, when appropriately installed, will address the inadequate wildlife habitat resource concern by planting a moderately diverse mix of seeds that is readily available for purchase from multiple vendors in combination with minor seed bed preparation. Seed is typically not available from traditional agricultural vendors and requires making a special order or ordering online. Other practices are planned and installed after planting to manage the habitat as needed.

Before Situation:

Vegetative habitat conditions (species diversity, richness, structure and pattern) do not meet planning criteria and do not have the potential to meet or exceed the minimum criteria through vegetative management activities alone. Current conditions and management are insufficient to address identified limiting habitat factor(s) or to increase planning criteria above a current planning criterion of at least 50% of the potential. Undesirable vegetation has been controlled or suppressed with the use of other conservation practice standards prior to implementation of this practice scenario.

After Situation:

Desired species have been planted and the Wildlife Habitat Planting criteria have been successfully implemented. The area will provide the identified habitat requirements for target species and will meet or exceed planning criteria for inadequate wildlife habitat.

Feature Measure: acres planted (per acre)

Scenario Unit: Acres

Scenario Typical Size: 5.00

Scenario Total Cost: $2,935.94

Scenario Cost/Unit: $587.19

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	5	$74.40
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	5	$111.35
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	2	$97.20
Materials						
Native Perennial Grasses, Legumes and/or Forb Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, moderate commercial availability	2619	Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed is moderately easy to purchase commercially. Includes materials and shipping.	Acres	$469.81	5	$2,349.05
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 420 - Wildlife Habitat Planting

Scenario: #235 - Low Species Diversity on Cropland with Foregone Income

Scenario Description:

A wildlife habitat evaluation or plant community inventory indicates a potential to improve wildlife habitat by altering the current vegetation conditions (species diversity, richness, structure and pattern) and changing use (annual crop to permanent vegetation) by establishing herbaceous plants. This practice scenario applies to cropland currently in production. The inadequate wildlife habitat resource concern is met by planting a low diversity, low cost mix of readily available seeds in combination with minor seed bed preparation. Weed pressure is minimal due to current and past management. Control or suppression of existing undesirable vegetation is accomplished through a single herbicide treatment. Post-planting weed treatment, beyond normal practice maintenance if necessary, will be accomplished by applying additional practice standards as appropriate.

Before Situation:

Vegetative habitat conditions (species diversity, richness, structure and pattern) do not meet planning criteria and do not have the potential to meet or exceed the minimum criteria through vegetative management activities alone. Current conditions and management are insufficient to address identified limiting habitat factor(s) or to increase planning criteria above a current planning criterion of at least 50% of the potential.

After Situation:

The land is no longer in crop production. Desired species have been planted and the Wildlife Habitat Planting criteria have been successfully implemented. As a result, the site will meet or exceed planning criteria for inadequate wildlife habitat.

Feature Measure: acres planted (per acre)

Scenario Unit: Acres

Scenario Typical Size: 5.00

Scenario Total Cost: $3,994.87

Scenario Cost/Unit: $798.97

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	5	$74.40
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	5	$33.65
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	5	$111.35
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$415.54	5	$2,077.70
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	4	$194.40
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$12.66	5	$63.30
Native Perennial Grasses, Legumes and/or Forbs, Low Density	2753	A mix of native perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Species typically easy to purchase. Includes material and shipping.	Acres	$190.81	5	$954.05
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 420 - Wildlife Habitat Planting

Scenario: #236 - Low Species Diversity on Non-Cropland, no Foregone Income

Scenario Description:

A wildlife habitat evaluation or plant community inventory indicates a potential to improve wildlife habitat by altering the current vegetation conditions (species diversity, richness, structure and pattern) by establishing herbaceous plants. This practice scenario applies to areas not in production (e.g. ??? fallow areas, forest understory, and non-cropped areas in and around crop fields). Control or suppression of a well-established existing stand of undesirable vegetation should have been completed prior to implementation of this practice scenario through successful implementation of other practice standards, including CPS 314 or CPS 315. This scenario, when appropriately installed, will address the inadequate wildlife habitat resource concern by planting a low diversity, low cost mix of readily available seeds in combination with minor seed bed preparation. Other practices are planned and installed after planting to manage the habitat as needed.

Before Situation:

Vegetative habitat conditions (species diversity, richness, structure and pattern) do not meet planning criteria and do not have the potential to meet or exceed the minimum criteria through vegetative management activities alone. Current conditions and management are insufficient to address identified limiting habitat factor(s) or to increase planning criteria above a current planning criterion of at least 50% of the potential. Undesirable vegetation has been controlled or suppressed with the use of other conservation practice standards prior to implementation of this practice scenario.

After Situation:

Desired species have been planted and the Wildlife Habitat Planting criteria have been successfully implemented. The area will provide the identified habitat requirements for target species and will meet or exceed planning criteria for inadequate wildlife habitat.

Feature Measure: acres planted (per acre)

Scenario Unit: Acres

Scenario Typical Size: 5.00

Scenario Total Cost: $1,540.94

Scenario Cost/Unit: $308.19

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	5	$74.40
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	5	$111.35
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	2	$97.20
Materials						
Native Perennial Grasses, Legumes and/or Forbs, Low Density	2753	A mix of native perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Species typically easy to purchase. Includes material and shipping.	Acres	$190.81	5	$954.05
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 420 - Wildlife Habitat Planting

Scenario: #237 - Specialized Habitat Requirements on Cropland with Foregone Income

Scenario Description:

A wildlife habitat evaluation or plant community inventory indicates a potential to improve wildlife habitat by altering the current vegetation conditions (species diversity, richness, structure and pattern) and changing use (annual crop to permanent vegetation) by establishing herbaceous plants. This practice scenario applies to cropland currently in production. The inadequate wildlife habitat resource concern is met by planting a specialized and often diverse mix of seeds that is NOT readily available for purchase, in combination with minor seed bed preparation. Seed is not available from traditional agricultural vendors and requires making a special order. Cost of seed is high due to limited availability and plant materials selected are needed to meet specific habitat requirements or ecosystem functions. Weed pressure is minimal due to current and past management. Control or suppression of existing undesirable vegetation is accomplished through a single herbicide treatment. Post-planting weed treatment, beyond normal practice maintenance if necessary, will be accomplished by applying additional practice standards as appropriate.

Before Situation:

Vegetative habitat conditions (species diversity, richness, structure and pattern) do not meet planning criteria and do not have the potential to meet or exceed the minimum criteria through vegetative management activities alone. Current conditions and management are insufficient to address identified limiting habitat factor(s) or to increase planning criteria above a current planning criterion of at least 50% of the potential.

After Situation:

The land is no longer in crop production. Desired species have been planted and the Wildlife Habitat Planting criteria have been successfully implemented. As a result, the site will meet or exceed planning criteria for inadequate wildlife habitat.

Feature Measure: acres planted (per acre)

Scenario Unit: Acres

Scenario Typical Size: 5.00

Scenario Total Cost: $8,071.02

Scenario Cost/Unit: $1,614.20

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	5	$74.40
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	5	$33.65
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	5	$111.35
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$415.54	5	$2,077.70
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	4	$194.40
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$12.66	5	$63.30
Native Perennial Grasses, Legumes and/or Forbs Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, limited species availability.	2618	Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a highly specialized mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed may have limited availability and be difficult to obtain, e.g. milkweed species. Restricted for use with Wildlife Habitat Planting (420) and Restoration of Rare or Declining Natural Communities (643). Includes materials and shipping.	Acres	$1,006.04	5	$5,030.20
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 420 - Wildlife Habitat Planting

Scenario: #238 - Specialized Habitat Requirements on Non-Cropland, no Foregone Income

Scenario Description:

A wildlife habitat evaluation or plant community inventory indicates a potential to improve wildlife habitat by altering the current vegetation conditions (species diversity, richness, structure and pattern) by establishing herbaceous plants. This practice scenario applies to areas not in production (e.g. ??? fallow areas, forest understory, and non-cropped areas in and around crop fields). Control or suppression of a well-established existing stand of undesirable vegetation should have been completed prior to implementation of this practice scenario through successful implementation of other practice standards, including CPS 314 or CPS 315. This scenario, when appropriately installed, will address the inadequate wildlife habitat resource concern by planting a specialized and often diverse mix of seeds that is NOT readily available for purchase, in combination with minor seed bed preparation. Seed is not available from traditional agricultural vendors and requires making a special order. Cost of seed is high due to limited availability and plant materials selected are needed to meet specific habitat requirements or ecosystem functions. Other practices are planned and installed after planting to manage the habitat as needed.

Before Situation:

Vegetative habitat conditions (species diversity, richness, structure and pattern) do not meet planning criteria and do not have the potential to meet or exceed the minimum criteria through vegetative management activities alone. Current conditions and management are insufficient to address identified limiting habitat factor(s) or to increase planning criteria above a current planning criterion of at least 50% of the potential. Undesirable vegetation has been controlled or suppressed with the use of other conservation practice standards prior to implementation of this practice scenario.

After Situation:

Desired species have been planted and the Wildlife Habitat Planting criteria have been successfully implemented. The area will provide the identified habitat requirements for target species and will meet or exceed planning criteria for inadequate wildlife habitat.

Feature Measure: acres planted (per acre)

Scenario Unit: Acres

Scenario Typical Size: 5.00

Scenario Total Cost: $6,077.78

Scenario Cost/Unit: $1,215.56

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	5	$74.40
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	5	$111.35
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	2	$97.20
Materials						
Native Perennial Grasses, Legumes and/or Forbs Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, limited species availability.	2618	Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a highly specialized mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed may have limited availability and be difficult to obtain, e.g. milkweed species. Restricted for use with Wildlife Habitat Planting (420) and Restoration of Rare or Declining Natural Communities (643). Includes materials and shipping.	Acres	$1,006.04	5	$5,030.20
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 420 - Wildlife Habitat Planting

Scenario: #239 - Very Small Acreage (<.5 ac) Planting with Seedlings

Scenario Description:

This scenario is applicable to very small areas (typical size is ?? acre) in need of wildlife habitat establishment by planting of potted plants, plugs, or similar non-seed plant materials. A wildlife habitat evaluation found the need to improve habitat by altering the current vegetative conditions (diversity, richness, structure or pattern). Potted herbaceous plants and/or shrubs are planted in 6??? rows and a 4??? spacing (1815 plants/acre) to facilitate access of the site with mechanical equipment (e.g., ATV, hand or riding mower) for weed control or other management after establishment. The site preparation requires treatment with broad spectrum herbicide to kill the existing vegetation. Then tillage, smoothing and firming of the soil is conducted prior to planting the plant materials.

Before Situation:

Vegetative habitat conditions (species diversity, richness, structure and pattern) do not meet planning criteria and have the potential to meet or exceed the minimum criteria. Current conditions and management are insufficient to address identified limiting habitat factor(s) or to increase planning criteria above a current planning criterion of at least 50% of the potential.

After Situation:

The Wildlife Habitat Planting criteria have been successfully implemented. The site has been mechanically and chemically treated and planting has occurred. The area is adequately stocked with desired species and full coverage of permanent vegetation is expected. The vegetative cover will provide the desired habitat requirements for target wildlife. The site meets or exceeds planning criteria for inadequate wildlife habitat.

Feature Measure: sg ft planted (1/4 acre)

Scenario Unit: Square Feet

Scenario Typical Size: 10,890.00

Scenario Total Cost: $7,145.29

Scenario Cost/Unit: $0.66

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	0.25	$3.72
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$10.18	0.25	$2.55
Chemical, ground application, forested land	1313	Chemical application performed by ground equipment where trees and terrain impede passage of wide boom sprayers. Utilizes forestry application methods that include heavy equipment such as skidders. Includes material, equipment, power unit and labor costs.	Acres	$112.55	0.25	$28.14
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	4	$114.84
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	6	$291.60
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$12.66	0.25	$3.17
Tree & Shrub, Specialty	1523	Locally-sourced, culturally significant, native, or other highly specialized trees and shrubs (e.g., American chestnut, American elm, Canada yew, Sagebrush). Potted or balled and burlapped tree or shrub, 5 gallon. Includes materials and shipping only.	Each	$13.69	454	$6,215.26
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 422 - Hedgerow Planting

Scenario: #1 - Pollinator Habitat

Scenario Description:
Where pollinator habitat is an additional wildlife habitat concern this scenario addresses the resource concern of inadequate fish and wildlife habitat. It provides both physical habitat by providing areas that are not disturbed by annual tillage and provides pollen and nector throughout the growing season by establishing a diverse mixture of flowering plants. Typically a mixture of 5 or more species is planted to improve diversity so that pollen and nector are avaiable as long as possible. Typical installation is in or at the edge of cropland or pasture. Typical installation involves tillage to prepare the site for planting. Flowering trees and shrubs adapted for local climatic and edaphic conditions are typically planted at eight foot intervals (this will vary with species selection and density goals). A native grass adapted to the local climatic and edaphic conditions will be drilled into the site at a rate that will achieve a minimum of 20 seeds per square foot. A locally adapted mixture of at 3 pollen and nectar producing plants will be drilled into the site. The species list in the component section of this scenario are strictly for deriving a cost. Species adapted to local climatic and edaphic conditions will be listed in the specification for the site. There is tremendous overlap between this practice and conservation practice 380 Windbreak/Shelterbelt establishment. The main difference is that conservation practice 380 is exclusively woody plants where practice 422 provides for the use of herbaceous materials. If a fence is needed to facilitate establishment use practice 382, Fence.

Before Situation:
Pollen and nector sources are lacking or are only availble for part of the growing season. Large cropland tracks lack undisturbed areas for ground nesting bees

After Situation:
Flowering plants supply pollen and nector throughout the growing season. Undisturbed areas provide nesting sites for bees and other native pollinators.

Feature Measure: Length of Hedgerow

Scenario Unit: Feet

Scenario Typical Size: 800.00

Scenario Total Cost: $3,236.82

Scenario Cost/Unit: $4.05

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	0.25	$3.72
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acres	$22.61	0.25	$5.65
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	0.25	$5.57
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$415.54	0.13	$54.02
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$342.50	0.13	$44.53
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	100	$2,871.00
Materials						
Shrub, Seedling, Small	1506	Bare root shrub seedling, 6 to 18 inches tall, includes containerized seedlings less than 10 cubic inches. Includes materials and shipping only.	Each	$1.06	50	$53.00
Tree, Hardwood, Seedling, Small	1509	Bare root hardwood seedlings 6 to 18 inches tall; includes tropical containerized seedlings of 8 cubic inches or smaller. Includes materials and shipping only.	Each	$0.95	50	$47.50
Tree shelter, mesh tree tube, 24 in.	1555	24 inch tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only.	Each	$0.53	50	$26.50
Animal repellent, chemical	1907	Chemical animal repellent to protect trees from animal damage. Includes materials and shipping only.	Gallons	$31.52	0.25	$7.88
Native Perennial Grasses, Legumes and/or Forb Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, moderate commercial availability	2619	Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed is moderately easy to purchase commercially. Includes materials and shipping.	Acres	$469.81	0.25	$117.45

Practice: 422 - Hedgerow Planting

Scenario: #4 - Wildlife, Warm Season Grass

Scenario Description:

Typically installed in or at the edge of cropland or pasture this scenario is used to address the Inadequate Habitat for Fish and Wildlife resource concern. Specifically, the establishment of dense vegetation in a linear design can be used to provide for several habitat elements depending on the needs identified in the habitat assessment. This scenario can provide: habitat conectivity, food, and cover for wildlife depending on design and plant species selection. The 422 standard for wildlife criteria calls for a minimum of two species of native plants.Typical installation involves tillage to prepare the site for planting. 2 Trees and/or shrubs adapted for local climatic and edaphic conditions are typically plant at eight foot intervals (this will vary with species selection and density goals). A mix of 2 native warm season grasses adapted to the local climatic and edaphic conditions will be drilled into the site at a rate that will achieve a minimum of 20 seeds per square foot. The species list in the component section of this scenario are strictly for deriving a cost. Plant species adapted to the local climatic and edaphic conditions that address the resource concern will be stated in the specification for the site. There is tremendous overlap between this practice and conservation practice 380 Windbreak/Shelterbelt establishment. The main difference is that conservation practice 380 is exclusively woody plants where practice 422 provides for the use of herbaceous materials. If a fence is needed to facilitate establishment use practice 382, Fence.

Before Situation:

Habitat patches lack connectivity. Cover is inadequate to allow wildlife to exploit cropland food resources. Berries and mast are limited.

After Situation:

Inadequate habitat for fish and wildlife is addressed for needs identified in the resource assessment. Habitat patches are connected by dense hedgerow vegetation. Food resources in crop fields are made availble by their proximity to hedgerow cover. Planting may include fruit and mast bearing species, improving food supply, depending on needs being addressed.

Feature Measure: Length of Hedgerow

Scenario Unit: Feet

Scenario Typical Size: 800.00

Scenario Total Cost: $3,301.32

Scenario Cost/Unit: $4.13

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	0.25	$3.72
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acres	$22.61	0.25	$5.65
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	0.25	$5.57
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$415.54	0.13	$54.02
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$342.50	0.13	$44.53
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	100	$2,871.00
Materials						
Shrub, Seedling, Medium	1507	Bare root shrub seedling, 18 to 36 inches tall; includes tropical containerized seedlings 10 to 20 cubic inches. Includes materials and shipping only.	Each	$1.56	50	$78.00
Tree, Hardwood, Seedling, Medium	1510	Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only.	Each	$1.74	50	$87.00
Tree shelter, mesh tree tube, 24 in.	1555	24 inch tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only.	Each	$0.53	50	$26.50
Animal repellent, chemical	1907	Chemical animal repellent to protect trees from animal damage. Includes materials and shipping only.	Gallons	$31.52	0.25	$7.88
Native Perennial Grasses, Legumes and/or Forb Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, moderate commercial availability	2619	Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed is moderately easy to purchase commercially. Includes materials and shipping.	Acres	$469.81	0.25	$117.45

Practice: 422 - Hedgerow Planting

Scenario: #6 - Wildlife Cool Season

Scenario Description:

Typically installed in or at the edge of cropland or pasture this scenario is used to address the Inadequate Habitat for Fish and Wildlife resource concern. Specifically, the establishment of dense vegetation in a linear design can be used to provide for several habitat elements depending on the needs identified in the habitat assessment. This scenario can provide: habitat conectivity, food, and cover for wildlife depending on design and plant species selection. The 422 standard for wildlife criteria calls for a minimum of two species of native plants.Typical installation involves tillage to prepare the site for planting. 2 Trees and/or shrubs adapted for local climatic and edaphic conditions are typically plant at eight foot intervals (this will vary with species selection and density goals). A native cool season grass adapted to the local climatic and edaphic conditions will be drilled into the site at a rate that will achieve a minimum of 20 seeds per square foot. The species list in the component section of this scenario are strictly for deriving a cost. Plant species adapted to the local climatic and edaphic conditions that address the resource concern will be stated in the specification for the site. There is tremendous overlap between this practice and conservation practice 380 Windbreak/Shelterbelt establishment. The main difference is that conservation practice 380 is exclusively woody plants where practice 422 provides for the use of herbaceous materials. If a fence is needed to facilitate establishment use practice 382, Fence.

Before Situation:

Habitat patches lack connectivity. Cover is inadequate to allow wildlife to exploit cropland food resources. Berries and mast are limited.

After Situation:

Inadequate habitat for fish and wildlife is addressed for needs identified in the resource assessment. Habitat patches are connected by dense hedgerow vegetation. Food resources in crop fields are made availble by their proximity to hedgerow cover. Planting may include fruit and mast bearing species, improving food supply, depending on needs being addressed.

Feature Measure: Length of Hedgerow

Scenario Unit: Feet

Scenario Typical Size: 800.00

Scenario Total Cost: $3,156.59

Scenario Cost/Unit: $3.95

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acres	$22.61	0.25	$5.65
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	0.25	$5.57
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$415.54	0.13	$54.02
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$342.50	0.13	$44.53
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	100	$2,871.00
Materials						
Shrub, Seedling, Medium	1507	Bare root shrub seedling, 18 to 36 inches tall; includes tropical containerized seedlings 10 to 20 cubic inches. Includes materials and shipping only.	Each	$1.56	100	$156.00
Animal repellent, chemical	1907	Chemical animal repellent to protect trees from animal damage. Includes materials and shipping only.	Gallons	$31.52	0.25	$7.88
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$47.76	0.25	$11.94

Practice: 430 - Irrigation Pipeline

Scenario: #1 - PVC, Less Than or Equal to 8 inches, Underground installation

Scenario Description:

Description: Below ground installation of PVC (Iron Pipe Size) pipeline. PVC (IPS) is manufactured in sizes (nominal diameter) from ??-inch to 36-inch; typical practice sizes range from 2-inch to 24-inch; and typical scenario size is 6-inch. Construct 1/4 mile (1,320 feet) of 6-inch, Class 125 (SDR-32.5), PVC pipeline with appurtenances, installed below ground with a minimum of 2 feet of ground cover. The unit is weight of pipe material in pounds. 1,320 feet of 6-inch, Class 125 (SDR-32.5) PVC pipe weighs 2.596 lb/ft, or a total of 3,427 pounds. Appurtenances include: couplings, fittings, air vents, pressure relief valves, thrust blocks, risers, and inline valves, and are included in the cost of pipe material (additional 10% of pipe material quantity). Cost of appurtenances does not include flow meters or backflow preventers. Typical installation applies to soils with no special bedding requirements.Resource Concerns: Inefficient Use of Irrigation Water; Inefficient Energy Use. Associated Practices: 436 - Irrigation Reservoir; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 443 - Irrigation System, Surface & Subsurface; 447 - Irrigation System, Tailwater Recovery; 533 - Pumping Plant; 634 - Waste Transfer.

Before Situation:

Pipeline needed to replace or supplement inefficient irrigation conveyance systems.

After Situation:

Pipeline installed to convey and/or distribute water to irrigation systems or reservoirs, minimizing non-beneficial water use, reducing soil erosion, and/or reducing energy use.

Feature Measure: Weight of Pipe

Scenario Unit: Pound

Scenario Typical Size: 3,427.00

Scenario Total Cost: $12,966.59

Scenario Cost/Unit: $3.78

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, Earth, 12 in. x 48 in.	53	Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling	Feet	$1.43	1320	$1,887.60
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	32	$918.72
Materials						
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.29	3769	$8,631.01
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 430 - Irrigation Pipeline

Scenario: #5 - HDPE (Iron Pipe Size & Tubing), Diameter 8 inches and less, Underground installation

Scenario Description:

Description: Below ground installation of HDPE (Iron Pipe Size & Tubing) pipeline. HDPE (IPS & Tubing) is manufactured in sizes (nominal diameter) from ??-inch to 24-inch; typical practice sizes range from 2-inch to 24-inch; and typical scenario size is 6-inch. Construct 1/4 mile (1,320 feet) of 6-inch, Class 130 (SDR-13.5), HDPE pipeline with appurtenances, installed below ground with a minimum 2 feet of ground cover. The unit is weight of pipe material in pounds. 1,320 feet of 6-inch, Class 130 (SDR-13.5), HDPE weighs 4.024 lb/ft, or a total of 5,312 pounds. Appurtenances include: fittings, air vents, pressure relief valves, thrust blocks, risers, and inline valves, and are included in the cost of pipe material (additional 10% of pipe material quantity). Cost of appurtenances does not include flow meters or backflow preventers. Typical installation applies to soils with no special bedding requirements.Resource Concerns: Inefficient Use of Irrigation Water; Inefficient Energy Use. Associated Practices: 436 - Irrigation Reservoir; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 443 - Irrigation System, Surface & Subsurface; 447 - Irrigation System, Tailwater Recovery; 533 - Pumping Plant; 634 - Waste Transfer.

Before Situation:

Pipeline needed to replace or supplement inefficient irrigation conveyance systems.

After Situation:

Pipeline installed to convey and/or distribute water to irrigation systems or reservoirs, minimizing non-beneficial water use, reducing soil erosion, and/or reducing energy use.

Feature Measure: Weight of Pipe

Scenario Unit: Pound

Scenario Typical Size: 5,312.00

Scenario Total Cost: $25,769.39

Scenario Cost/Unit: $4.85

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, Earth, 12 in. x 48 in.	53	Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling	Feet	$1.43	1320	$1,887.60
Fuser for HDPE Pipe	1383	Fusing machine for 1 to 12 inch diameter HDPE pipe joints. Equipment costs only. Does not include labor.	Hours	$28.59	16	$457.44
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	32	$918.72
Materials						
Pipe, HDPE, smooth wall, weight priced	1379	High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only.	Pound	$3.59	5843	$20,976.37
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 430 - Irrigation Pipeline

Scenario: #6 - HDPE (Iron Pipe Size & Tubing) , Diameter 10 inches and greater, Underground installation

Scenario Description:

Description: Below ground installation of HDPE (Iron Pipe Size & Tubing) pipeline. HDPE (IPS & Tubing) is manufactured in sizes (nominal diameter) from ??-inch to 24-inch; typical practice sizes range from 2-inch to 24-inch; and typical scenario size is 12-inch. Construct 1/4 mile (1,320 feet) of 12-inch, Class 130 (SDR-13.5), HDPE pipeline with appurtenances, installed below ground with a minimum 2 feet of ground cover. The unit is weight of pipe material in pounds. 1,320 feet of 12-inch, Class 130 (SDR-13.5), HDPE weighs 14.89 lb/ft, or a total of 19,655 pounds. Appurtenances include: fittings, air vents, pressure relief valves, thrust blocks, risers, and inline valves, and are included in the cost of pipe material (additional 10% of pipe material quantity). Cost of appurtenances does not include flow meters or backflow preventers. Typical installation applies to soils with no special bedding requirements.Resource Concerns: Inefficient Use of Irrigation Water; Inefficient Energy Use. Associated Practices: 436 - Irrigation Reservoir; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 443 - Irrigation System, Surface & Subsurface; 447 - Irrigation System, Tailwater Recovery; 533 - Pumping Plant; 634 - Waste Transfer.

Before Situation:

Pipeline needed to replace or supplement inefficient irrigation conveyance systems.

After Situation:

Pipeline installed to convey and/or distribute water to irrigation systems or reservoirs, minimizing non-beneficial water use, reducing soil erosion, and/or reducing energy use.

Feature Measure: Weight of Pipe

Scenario Unit: Pound

Scenario Typical Size: 19,655.00

Scenario Total Cost: $85,023.37

Scenario Cost/Unit: $4.33

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, Earth, loam, 24 in. x 48 in.	54	Trenching, earth, loam, 24 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling	Feet	$3.06	1320	$4,039.20
Fuser for HDPE Pipe	1383	Fusing machine for 1 to 12 inch diameter HDPE pipe joints. Equipment costs only. Does not include labor.	Hours	$28.59	16	$457.44
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	48	$1,378.08
Materials						
Pipe, HDPE, smooth wall, weight priced	1379	High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only.	Pound	$3.59	21621	$77,619.39
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 430 - Irrigation Pipeline

Scenario: #50 - Deep Buried HDPE or PVC Pipe, 5 to 6 feet deep, to service microirrigation system

Scenario Description:
Buried installation of HDPE pipeline, 5 to 6 feet deep (below deep frost line) . HDPE (IPS &Tubing) is manufactured in sizes (nominal diameter) from ??-inch to 24-inch; typical practice sizes range from 1-inch to 2-inch; and typical scenario size is 1.25-inch. Construct 200 feet of 1.25 inch, (SDR- 11.0, PE4708), HDPE Pipeline with appurtenances, installed 5 to 6 feet below the ground surface to prevent the pipeline from freezing . The scenario unit is weight of pipe. 1.25-inch, 160 psi (SDR-11.0, PE4708), HDPE pipe weighs 0.305 lb/ft. Appurtenances include: fittings, air vents, pressure relief valves, anchors, thrust blocks, risers, and inline valves, and are included in the cost of pipe material (additional 15% of pipe material quantity). Cost of appurtenances does not include flow meters or backflow preventers. Typical installation applies to soils with no special bedding requirements. Resource Concerns: Inefficient Use of Irrigation Water; Inefficient Energy Use. Associated Practices: 436 - Irrigation Reservoir; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 443 - Irrigation System, Surface &Subsurface; 447 - Irrigation System, Tailwater Recovery; 533 - Pumping Plant; 634 - Waste Transfer.

Before Situation:
Pipeline needed to replace or supplement inefficient irrigation conveyance systems.

After Situation:
Pipeline installed to convey and/or distribute water to irrigation systems or reservoirs, minimizing non-beneficial water use, reducing soil erosion, and/or reducing energy use.

Feature Measure: Weight of Pipe

Scenario Unit: Pound

Scenario Typical Size: 61.00

Scenario Total Cost: $2,288.33

Scenario Cost/Unit: $37.51

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	4	$264.72
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	4	$114.84
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	4	$160.52
Materials						
Pipe, HDPE, smooth wall, weight priced	1379	High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only.	Pound	$3.59	61	$218.99
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 430 - Irrigation Pipeline

Scenario: #66 - PVC (Iron Pipe Size), less than or equal to 4 inch, Small Scale System

Scenario Description:
Below ground installation of PVC (Iron Pipe Size) pipeline. PVC (IPS) is manufactured in sizes (nominal diameter) from ??-inch to 36- inch; typical practice sizes range from 2-inch to 24-inch; and typical scenario size is 3-inch. Construct 260 feet of 3-inch, Class 125 (SDR-32.5), PVC pipeline with appurtenances, installed below ground with a minimum of 2 feet of ground cover. The unit is weight of pipe material in pounds. 260 feet of 3-inch, Class 125 (SDR-32.5) PVC pipe weighs 0.730 lb/ft, or a total of 189.8 pounds. Appurtenances include: couplings, fittings, air vents, pressure relief valves, thrust blocks, risers, and inline valves, and are included in the cost of pipe material (additional 10% of pipe material quantity). Cost of appurtenances does not include flow meters or backflow preventers. Typical installation applies to soils with no special bedding requirements. Resource Concerns: Inefficient Use of Irrigation Water; Inefficient Energy Use. Associated Practices: 436 - Irrigation Reservoir; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 443 - Irrigation System, Surface &Subsurface; 447 - Irrigation and Drainage Tailwater Recovery; 533 - Pumping Plant; 634 - Waste Transfer.

Before Situation:
Pipeline needed to replace or supplement inefficient irrigation conveyance systems.

After Situation:
Pipeline installed to convey and/or distribute water to irrigation systems or reservoirs, minimizing non-beneficial water use, reducing soil erosion, and/or reducing energy use.

Feature Measure: Length of Pipe

Scenario Unit: Linear Feet

Scenario Typical Size: 260.00

Scenario Total Cost: $2,551.43

Scenario Cost/Unit: $9.81

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, Earth, 12 in. x 48 in.	53	Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling	Feet	$1.43	260	$371.80
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	6	$172.26
Materials						
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.29	208.78	$478.11
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 430 - Irrigation Pipeline

Scenario: #83 - Directional Boring

Scenario Description:
200 ft of steel or HDPE casing installed by boring through road bed or under streams to accommodate a high pressure irrigation pipeline that conveys irrigation water from the supply to the demand. Typical trencher or plowing installation is not possible due to site disturbance or environmental concerns. Revegetation is not included. This scenario addresses inefficient use of irrigation water and inefficient energy use. The site should be evaluated by the designing engineer before contracting. Permitting is usually required from the applicable highway department. Associated practices may include PS 436 - Irrigation Reservoir; PS 441 - Microirrigation; 442 Sprinkler System; PS 533 Pumping Plant; and PS 516 Livestock Pipeline.

Before Situation:
Pipeline needed to replace or supplement inefficient irrigation conveyance systems.

After Situation:
Pipeline installed to convey or distribute water to irrigation systems or reservoirs, minimizing non-beneficial water use, reducing soil erosion, or reducing energy.

Feature Measure: Length of Pipe installed with Boring

Scenario Unit: Linear Feet

Scenario Typical Size: 200.00

Scenario Total Cost: $39,188.12

Scenario Cost/Unit: $195.94

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Horizontal Boring, Greater Than 3 in. diameter	1132	Includes equipment, labor and setup.	Feet	$123.38	200	$24,676.00
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	8	$350.96
Materials						
Pipe, Steel, Std Wt., Used, weight priced	2870	Schedule 40 steel pipe, used. Materials only.	Pound	$0.96	14118	$13,553.28
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	2	$607.88

Practice: 430 - Irrigation Pipeline

Scenario: #104 - HDPE (Iron Pipe Size and Tubing), less than or equal to 2 inch, Small Scale

Scenario Description:
Below ground installation of HDPE (Iron Pipe Size &Tubing) pipeline. HDPE (IPS &Tubing) is manufactured in sizes (nominal diameter) from ??-inch to 24-inch; and typical scenario size is 1-inch. Construct 260 feet of 1-inch, Class 130 (SDR 13.5), HDPE pipeline with appurtenances, installed below ground with a minimum 2 feet of ground cover. The unit is weight of pipe material in pounds. 260 feet of 1-inch, Class 130 (SDR-13.5), HDPE weighs 0.16 lb/ft, or a total of 42 pounds. Appurtenances include: fittings, air vents, pressure relief valves, thrust blocks, risers, and inline valves, and are included in the cost of pipe material (additional 10% of pipe material quantity). Cost of appurtenances does not include flow meters or backflow preventers.Typical installation applies to soils with no special bedding requirements. Resource Concerns: Inefficient Use of Irrigation Water; Inefficient Energy Use. Associated Practices: 436 - Irrigation Reservoir; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 443 - Irrigation System, Surface &Subsurface; 447 - Irrigation System, Tailwater Recovery; 533 - Pumping Plant; 634 - Waste Transfer

Before Situation:
Pipeline needed to replace or supplement inefficient irrigation conveyance systems.

After Situation:
Pipeline installed to convey and/or distribute water to irrigation systems or reservoirs, minimizing non-beneficial water use, reducing soil erosion, and/or reducing energy use.

Feature Measure: Weight of Pipe

Scenario Unit: Pound

Scenario Typical Size: 42.00

Scenario Total Cost: $2,754.28

Scenario Cost/Unit: $65.58

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, Earth, 12 in. x 48 in.	53	Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling	Feet	$1.43	260	$371.80
Fuser for HDPE Pipe	1383	Fusing machine for 1 to 12 inch diameter HDPE pipe joints. Equipment costs only. Does not include labor.	Hours	$28.59	8	$228.72
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	16	$459.36
Materials						
Pipe, HDPE, smooth wall, weight priced	1379	High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only.	Pound	$3.59	46	$165.14
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 430 - Irrigation Pipeline

Scenario: #105 - Surface HDPE (Iron Pipe Size and Tubing), less than or equal to 2 inch, Small Scale

Scenario Description:
On-ground surface installation of HDPE (Iron Pipe Size &Tubing) pipeline. HDPE (IPS &Tubing) is manufactured in sizes (nominal diameter) from ??-inch to 24-inch; and typical scenario size is 1-inch. Construct 260 feet of 1-inch, Class 130 (SDR 13.5), HDPE pipeline with appurtenances. The unit is weight of pipe material in pounds. 260 feet of 1-inch, Class 130 (SDR-13.5), HDPE weighs 0.16 lb/ft, or a total of 42 pounds. Appurtenances include: fittings, air vents, pressure relief valves, thrust blocks, risers, and inline valves, and are included in the cost of pipe material (additional 10% of pipe material quantity). Cost of appurtenances does not include flow meters or backflow preventers.Typical installation applies to soils with no special bedding requirements. Resource Concerns: Inefficient Use of Irrigation Water; Inefficient Energy Use. Associated Practices: 436 - Irrigation Reservoir; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 443 - Irrigation System, Surface &Subsurface; 447 - Irrigation System, Tailwater Recovery; 533 - Pumping Plant; 634 - Waste Transfer

Before Situation:
Pipeline needed to replace or supplement inefficient irrigation conveyance systems.

After Situation:
Pipeline installed to convey and/or distribute water to irrigation systems or reservoirs, minimizing non-beneficial water use, reducing soil erosion, and/or reducing energy use.

Feature Measure: Weight of Pipe

Scenario Unit: Pound

Scenario Typical Size: 42.00

Scenario Total Cost: $462.06

Scenario Cost/Unit: $11.00

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	4	$114.84
Materials						
Pipe, HDPE, smooth wall, weight priced	1379	High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only.	Pound	$3.59	46	$165.14
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08

Practice: 432 - Dry Hydrant

Scenario: #3 - PVC

Scenario Description:

A non-pressurized permanent PVC pipe assembly system installed into an adequate water source with an all weather access that permits the withdrawal of water by suction for fire suppression, livestock, small acreage irrigation, or wetland management. The location must have an adequate volume of water available, facilitate movement to and from the hydrant site, and where a source of water is needed for fire suppression, livestock, small acreage irrigation, or wetland management.

Before Situation:

A location where an adequate volume of water is available, facilitate movement to and from the hydrant site, and where an adequate source of water is needed for fire suppression, livestock, small acreage irrigation, or wetland management

After Situation:

The typical dry hydrant will use 200 ft. of 6 inch PVC pipe, installed into an adequate water source with an all weather access that permits the withdrawal of water by suction. The pipe is fitted with an intake strainer and hydrant head for quick connect/release. Plastic pipe is protected from ultraviolet rays. The dry hydrant is constructed by installing the pipe using a backhoe or other trenching equipment. Vegetation of disturbed areas will be completed under critical area planting (342). All weather access will use Heavy Use Area Protection (561). Erosion control during construction activities will use Stormwater Runoff Control (570). Other associated practices include Pond (378), Dam (402), Access Road (560), and Access Control (472).

Feature Measure: Number

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $5,439.76

Scenario Cost/Unit: $5,439.76

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, Earth, 12 in. x 48 in.	53	Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling	Feet	$1.43	200	$286.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	16	$459.36
Materials						
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.29	716	$1,639.64
Lumber, planks, posts and timbers, treated	1609	Treated dimension lumber with nominal thickness greater than 2 inches. Includes lumber and fasteners. Does not include labor.	Board Feet	$3.53	122	$430.66
Well Cap, 6 in.	1786	Well cap, 6 inch. Materials only.	Each	$58.35	1	$58.35
Well Screen, plastic, 6 in.	1999	6 inch PVC well screen. Materials only.	Feet	$20.46	1	$20.46
Pipe, PVC, 6 in., Elbow, 45 degree	2283	Pipe, PVC Schedule 40, 6 inch Diameter, Elbow, 45 Degree. Material cost only.	Each	$66.85	3	$200.55
Pipe, PVC, 6 in., Coupling	2286	Pipe, PVC Schedule 40, 6 inch Diameter, Coupling. Material cost only.	Each	$28.96	7	$202.72
Dry Hydrant head assembly, 6 in. PVC, 90 degree	2288	Dry Hydrant assembly for 6 inch PVC pipe consisting of 90 degree pipe elbow, bronze insert with 6-inch NST male thread, rubber 'O' ring, threaded cap, conical strainer, and end cap. Material cost only.	Each	$560.01	1	$560.01
Pipe, PVC Cement	2292	PVC Cement, 16 Oz. For Use With PVC, CPVC, ABS, Schedule 40 And 80 Pipes And Fittings.	Each	$26.34	1	$26.34
Pipe, PVC Primer Cleaner	2293	PVC Primer, 16 Oz. For Use With PVC and CPVC Pipes And Fittings.	Each	$23.54	1	$23.54
Post, Rebar 1/2 in. x 8 ft.	2294	Fabricated post consisting of 1/2 inch diameter rebar approximately 8 feet long. Material only.	Each	$2.87	1	$2.87
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 436 - Irrigation Reservoir

Scenario: #13 - Embankment Reservoir <= 30 Acre-Feet

Scenario Description:

This is a small rectangular embankment reservoir with a 10' diameter principal spillway through the embankment controlled by a canal-type gate. It is designed to accumulate, store, and deliver water by gravity to an open ditch or non-pressurized pipeline, in excess of 5 cfs. It will have an inside dimension of about 375 feet square, with 12 feet of fill and about 1600 feet total length of embankment (along the centerline). The embankment top will be 10 feet wide and the side slopes will no steeper than 2.5 H to 1 V inside and out. It will be built with approximately 28,500 cubic yards of on-site material. It will have a maximum water depth of 10 feet with 2 feet of freeboard and no auxiliary spillway. Volume is approximately 30 ac-ft (10,000,000 gallons). Resource Concern: Insufficient Water - Inefficient use of irrigation water.Associated Practices: 521 - Pond Sealing or Lining (various); 320 - Irrigation Canal or Lateral; 430 - Irrigation Pipeline; 428 - Irrigation Ditch Lining; 533 - Pumping Plant; 440 series - Irrigation Systems; 447 - Irrigation System, Tailwater Recovery; 378 - Pond; 484 - Mulching; and 342 - Critical Area Planting.

Before Situation:

Current system relies on an intermittent or low-flow rate water source. This results in untimely and/or inefficient water application.

After Situation:

The square reservoir will be built on a relatively flat site and be used to accumulate and store water for timely application through an irrigation system. The water source could be a stream, an irrigation well, or an irrigation district canal.

Feature Measure: Volume of Compacted Earthfill

Scenario Unit: Cubic Yards

Scenario Typical Size: 28,500.00

Scenario Total Cost: $122,224.55

Scenario Cost/Unit: $4.29

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	28500	$114,285.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	16	$459.36
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	8	$388.80
Materials						
Pipe, HDPE, corrugated double wall, LTE-12 in., soil tight, weight priced	1587	High Density Polyethylene (HDPE) compound manufactured into double wall corrugated pipe LTE-12 inch diameter. Materials only.	Pound	$3.10	231	$716.10
Screw gate, cast iron, 10 in. diameter, 10/0 head	1916	10 inch diameter cast iron screw (canal) gate rated at 10 seating head 0 feet unseating head. Materials only.	Each	$903.85	1	$903.85
Catwalk, metal	1918	Metal pedestrian walk way giving access to the valve on a structure, typically 3 ft. wide with railing. Materials only.	Feet	$104.79	20	$2,095.80
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	2	$1,846.38

Practice: 436 - Irrigation Reservoir

Scenario: #15 - Excavated Tailwater Pit

Scenario Description:

This is an excavated pit with a control structure. It is designed to accumulate, store, deliver or regulate water for a surface irrigation system. It will have a bottom width of 20 ft and length of 1,250 feet. The side slopes will be no steeper than 1.5 H to 1 V inside and out. It will be built with approximately 20,000 cubic yards of on-site material. It will have a maximum water depth of 10 feet with 1 feet of freeboard. Volume is approximately 12 ac-ft (3,950,303 gallons). Resource concern: Insufficient Water - Inefficient use of irrigation water.Associated Practices: 521 - Pond Sealing or Lining (various); 320 - Irrigation Canal or Lateral; 430 - Irrigation Pipeline; 428 - Irrigation Ditch Lining; 533 - Pumping Plant; 440 series - Irrigation Systems; 447 - Irrigation System, Tailwater Recovery; 378 - Pond; 484 - Mulching; and 342 - Critical Area Planting.

Before Situation:

Current system relies on an intermittent or low-flow rate water source. This results in untimely and/or inefficient water application.

After Situation:

An excavated regulating reservoir will be built on a relatively flat site and be used to accumulate and store water for timely application through an irrigation system. The water source could be a stream or an irrigation district canal.

Feature Measure: Volume of Earth Excavated

Scenario Unit: Cubic Yards

Scenario Typical Size: 19,600.00

Scenario Total Cost: $52,003.01

Scenario Cost/Unit: $2.65

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	19600	$49,392.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	2	$1,846.38

Practice: 436 - Irrigation Reservoir

Scenario: #31 - Plastic tank, less than or equal to 1,000 gallons

Scenario Description:

A 1,000 Gallon, above-ground, High Density Polyethylene plastic enclosed tank, is installed on 6' of well-compacted drain rock or a 4' thick reinforced concrete support pad, to store water from a reliable source for irrigation of an area less than one acre. The scenario assumes the typical dimensions of the tank are 72' in diameter and 66' tall. The scenario also assumes a 96' diameter gravel base or concrete pad to extend a minimum of 12' past the base of tank for adequate foundation support. This cost estimate scenario is for cost of the tank and pad only and does not include estimate for pumps, pipe, or connecting fittings. Resource Concern: Insufficient Water - Inefficient use of irrigation water. Associated Practices: 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 533 - Pumping Plant; 447 - Irrigation System, Tailwater Recovery.

Before Situation:

Insufficient volume of water to complete an irrigation cycle at the required flow rate.

After Situation:

An above-ground plastic tank, constructed to withstand the elements, is used to accumulate and store water between irrigation cycles for a very small irrigation system. This allows for an improved flow rate and timing of water application. Sources of water could be a well, a domestic water system, a large roof area, a water ram , or a pump drawing water from a stream.

Feature Measure: Volume of Tank Storage

Scenario Unit: Gallons

Scenario Typical Size: 1,000.00

Scenario Total Cost: $5,764.24

Scenario Cost/Unit: $5.76

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hydraulic Excavator, .5 CY	930	Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included.	Hours	$101.18	1	$101.18
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$56.88	6	$341.28
Plate compactor	1915	Manually guided vibratroy plate compactor. Equipment only.	Hours	$19.02	1	$19.02
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	2	$57.42
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	2	$60.72
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	6	$240.78
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	16	$777.60
Materials						
Tank, Poly enclosed Storage, 300-1000 gal	1074	Water storage tanks. Includes materials and shipping only.	Gallons	$1.68	1000	$1,680.00
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$23.32	1	$23.32
Cable, Galvanized steel	2182	Galvanized steel aircraft cable in 7 x 19 strand core. Materials and shipping only.	Feet	$0.68	40	$27.20
Anchor, earthen, low disturbance, large	2184	Low disturbance, galvanized or aluminum alloy earthen anchors with holding power greather than 3,000 pounds in normal soil. Materials and shipping only.	Each	$59.59	4	$238.36
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	2	$364.16
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 441 - Irrigation System, Microirrigation

Scenario: #1 - Subsurface Drip Irrigation (SDI)

Scenario Description:

A subsurface drip irrigation system (SDI) with a lateral spacing between 37-59 inches. This buried drip irrigation system utilizes a thinwall dripperline or tape with inline emitters at a uniform spacing for the system laterals. The dripperline or tape is normally installed by being plowed in approx 10-14 inches deep with a chisel shank type plow equipped with tape reels. This type of drip irrigation system utilizes a buried supply manifold with automated zone control valves and a buried flush manifold with manual flush valves. This permanent micro-irrigation system includes an automated filter station, flow meter, backflow prevention device, automated control box or timer, the thinwall dipperline or tape for laterals, both a supply and a flushing manifold and numerous types of water control valves. This is an all-inclusive system starting with the filter station including all required system components out to the flush valves. The water supply line from the water source to the filter station is an irrigation pipeline (430) and is not included as part of this systemResource Concerns: Insufficient Water - Inefficient use of irrigation water, Degraded Plant Condition - Undesirable plantproductivity and health, Water Quality Degradation - Excessive sediment in surface waters, and Inefficient Energy Use - Equipment and facilities.Associated Practices: 533-Pumping Plant, 449- Irrigation Water Management, 430 - Irrigation Pipeline, 433 - Irrigation Flow Measrement, 610 - Salinity & Sodic Soil Management, 434 - Soil Moisture Measurement, 328-Conservation Crop Rotation, and 590 Nutrient Management.

Before Situation:

Typical before irrigation situation would normally be an existing inefficient surface or sprinkler irrigation system on a cropland or hayland field. The existing irrigation system would experience poor, non-uniform irrigation applications and significant water losses affecting both water quantity and water quality

After Situation:

A typical practice would be the installation of a subsurface drip irrigation system (SDI) on a 60 acre cropland or hayland field. The system lateral (thinwall dripperline or tape) spacing would 40 inches. This highly efficient SDI (buried) irrigation system provides irrigation water directly to the plant root zone eliminating application losses resulting in a very high water application efficiency and properly designed these SDI systems are capable of very uniform water applications.Typical field size is 60 acres.

Feature Measure: Acres in System

Scenario Unit: Acres

Scenario Typical Size: 60.00

Scenario Total Cost: $156,587.92

Scenario Cost/Unit: $2,609.80

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, Earth, 12 in. x 48 in.	53	Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling	Feet	$1.43	6800	$9,724.00
Micro Irrigation, chemical injection equipment	1987	Chemical Injector Pump, plus chemigation check valve, injector ports, and appurtenances, Installation included.	Each	$2,151.39	1	$2,151.39
Materials						
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.29	4800	$10,992.00
Flow Meter, with Electronic Index	1452	10 inch Turbine Irrigation flow meter, with Electronic Index, Rate and Volume, permanently installed. Materials only.	Each	$3,628.64	1	$3,628.64
Micro Irrigation, Media Filter, 30 to 48 in. Dia. tank, Equipped for Automatic Flush	1482	Sand or media filter for Micro irrigation system. Includes plumbing, connections and automatic controller. Unit is complete and installed. Unit price per filter, not per filter station.	Each	$6,901.92	3	$20,705.76
Micro Irrigation, screen filter, => 100 gpm	1484	Screen filter for Micro irrigation system with 100 gpm or greater capacity. Includes plumbing, connections and automatic controller. Unit price per filter, not per filter station.	Each	$1,070.30	1	$1,070.30
Micro Irrigation, control valves and timers	1485	Automatic controller and timer, to turn on and off the sets for micro irrigation, and valves. Based on control unit, not number of valves controlled.	Each	$417.16	1	$417.16
Micro Irrigation, buried drip tape	2521	Tape that is installed underground for sub-surface drip irrigation, includes installation, and connections to the supply and flushing laterals.?? Tape is a minimum of 10 mil thick thick and has emitters built in. Includes labor and installtion.	Feet	$0.13	824108	$107,134.04
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 441 - Irrigation System, Microirrigation

Scenario: #2 - Surface drip irrigation with emitters, greater than 2 acre

Scenario Description:

A micro-irrigation system, utilizing surface PE tubing (can be placed on trelis or above ground) with emitters to provide irrigation for an orchard, vinyard, or other specialty crop grown in a grid pattern. The typical system is a permanent system, installed on a 60 acre vineyard on the ground surface or trellis. The vineyard has a plant spacing of 8 feet x 9 feet. Laterals are spaced 9 feet apart.This system utilizes emitters at each tree or plant as the water application device. This system typically includes a filter system, PE tubing laterals, PVC manifolds, and submains, valves, fittings, emitters, etc. This practice applies to systems designed to discharge < 60 gal/hr at each individual lateral discharge point. Does not include Pump, Power source, Water source (well or reservoir). Resource Concerns: Insufficient Water - Inefficient use of irrigation water, Degraded Plant Condition - Undesirable plantproductivity and health, Water Quality Degradation - Excessive sediment in surface waters, and Inefficient Energy Use - Equipment and facilities.Associated Practices: 533-Pumping Plant, 449- Irrigation Water Management, 430 - Irrigation Pipeline, 433 - Irrigation Flow Measrement, 610 - Salinity & Sodic Soil Management, 434 - Soil Moisture Measurement, 328-Conservation Crop Rotation, and 590 Nutrient Management.

Before Situation:

A vineyard has an inefficient surface flood irrigation system causing irrigation water loss that impacts water quality and water quantity.

After Situation:

A surface placed microirrigation system is utilized to provide highly efficient irrigation to an vineyard. Water applications are reduced and runoff eliminated. Offsite water quality is improved, and on site water use is reduced.

Feature Measure: Acres in System

Scenario Unit: Acres

Scenario Typical Size: 60.00

Scenario Total Cost: $161,301.42

Scenario Cost/Unit: $2,688.36

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, Earth, 12 in. x 48 in.	53	Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling	Feet	$1.43	6800	$9,724.00
Micro Irrigation, chemical injection equipment	1987	Chemical Injector Pump, plus chemigation check valve, injector ports, and appurtenances, Installation included.	Each	$2,151.39	1	$2,151.39
Materials						
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.29	4800	$10,992.00
Flow Meter, with Electronic Index	1452	10 inch Turbine Irrigation flow meter, with Electronic Index, Rate and Volume, permanently installed. Materials only.	Each	$3,628.64	1	$3,628.64
Micro Irrigation, Media Filter, 30 to 48 in. Dia. tank, Equipped for Automatic Flush	1482	Sand or media filter for Micro irrigation system. Includes plumbing, connections and automatic controller. Unit is complete and installed. Unit price per filter, not per filter station.	Each	$6,901.92	3	$20,705.76
Micro Irrigation, screen filter, => 100 gpm	1484	Screen filter for Micro irrigation system with 100 gpm or greater capacity. Includes plumbing, connections and automatic controller. Unit price per filter, not per filter station.	Each	$1,070.30	1	$1,070.30
Micro Irrigation, control valves and timers	1485	Automatic controller and timer, to turn on and off the sets for micro irrigation, and valves. Based on control unit, not number of valves controlled.	Each	$417.16	1	$417.16
Micro Irrigation, surface drip tubing	1488	Tubing is installed above ground for surface drip irrigation, and connections to the supply and flushing laterals. Tubing has emitters built in.	Feet	$0.35	319440	$111,804.00
Pressure Regulator	2468	Materials for pressure regulator less than or equal to 2 inch diameter.	Each	$43.54	1	$43.54
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 441 - Irrigation System, Microirrigation

Scenario: #4 - Surface drip irrigation, hoop house

Scenario Description:

Drip irrigation system for a Drip irrigation system for 30' x 96' seasonal high tunnel, 24' rows with emmitters on a 8' spacing.

Resource Concerns: Insufficient Water - Inefficient use of irrigation water, Degraded Plant Condition - Undesirable plantproductivity and health, Water Quality Degradation - Excessive sediment in surface waters, and Inefficient Energy Use - Equipment and facilities.Associated Practices: 533-Pumping Plant, 449- Irrigation Water Management, 430 - Irrigation Pipeline, 433 - Irrigation Flow Measrement, 328-Conservation Crop Rotation, and 590 Nutrient Management.

Before Situation:

A field has an inefficient garden-hose based sprinkler irrigation system causing irrigation water loss that impacts water quality and water quantity.

After Situation:

A surface placed microirrigation system is utilized to provide highly efficient irrigation to an area. Water applications are reduced and runoff eliminated. Offsite water quality is improved, and on site water use is reduced.

Feature Measure: Area irrigated

Scenario Unit: Square Feet

Scenario Typical Size: 2,880.00

Scenario Total Cost: $788.61

Scenario Cost/Unit: $0.27

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	6	$172.26
Materials						
Micro Irrigation, surface drip tubing	1488	Tubing is installed above ground for surface drip irrigation, and connections to the supply and flushing laterals. Tubing has emitters built in.	Feet	$0.35	1350	$472.50
Micro Irrigation, screen filter, < 100 gpm	1617	Screen filter for Micro Irrigation used in small systems. Includes filter. No controls are included or needed.	Each	$100.31	1	$100.31
Pressure Regulator	2468	Materials for pressure regulator less than or equal to 2 inch diameter.	Each	$43.54	1	$43.54

Practice: 441 - Irrigation System, Microirrigation

Scenario: #5 - Surface drip irrigation, outdoor plot, 2 ac or less

Scenario Description:

Drip irrigation system for a 1 acre organic vegetabale field, 30'' rows with emmitters on a 1' spacing.

Resource Concerns: Insufficient Water - Inefficient use of irrigation water, Degraded Plant Condition - Undesirable plantproductivity and health, Water Quality Degradation - Excessive sediment in surface waters, and Inefficient Energy Use - Equipment and facilities.Associated Practices: 533-Pumping Plant, 449- Irrigation Water Management, 430 - Irrigation Pipeline, 433 - Irrigation Flow Measrement, 328-Conservation Crop Rotation, and 590 Nutrient Management.

Before Situation:

A field has an inefficient garden-hose based sprinkler irrigation system causing irrigation water loss that impacts water quality and water quantity.

After Situation:

A surface placed microirrigation system is utilized to provide highly efficient irrigation to the seasonal high tunnel area. Water applications are reduced and runoff eliminated. Offsite water quality is improved, and on site water use is reduced.

Feature Measure: Area irrigated

Scenario Unit: Square Feet

Scenario Typical Size: 43,560.00

Scenario Total Cost: $7,796.83

Scenario Cost/Unit: $0.18

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	24	$689.04
Materials						
Pipe, HDPE, smooth wall, weight priced	1379	High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only.	Pound	$3.59	66	$236.94
Micro Irrigation, surface drip tubing	1488	Tubing is installed above ground for surface drip irrigation, and connections to the supply and flushing laterals. Tubing has emitters built in.	Feet	$0.35	19220	$6,727.00
Micro Irrigation, screen filter, < 100 gpm	1617	Screen filter for Micro Irrigation used in small systems. Includes filter. No controls are included or needed.	Each	$100.31	1	$100.31
Pressure Regulator	2468	Materials for pressure regulator less than or equal to 2 inch diameter.	Each	$43.54	1	$43.54

Practice: 441 - Irrigation System, Microirrigation

Scenario: #18 - Surface Tape

Scenario Description:

A micro-irrigation system using drip tape or similar type micro-irrigation material placed on the soil surface for vegetables or field crops. Spacing of drip tape or similar type micro irrigation material is based on soil type or row alignment but will typically vary from 18' to 36'. This system typically includes a filter system, PE manifolds fittings, drip tape, etc. This practice applies to systems designed to discharge < 60 gal/hr at each individual discharge point. Does not include Pump, power source, water source. Surface placed drip tape will not meet the 441 practice life and will normally need replacement every year. After first installation drip tape will be replaced as operation and maintenance issue as required for proper operation of the system. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, Degraded Plant Condition - Undesirable plantproductivity and health, Water Quality Degradation - Excessive sediment in surface waters, and Inefficient Energy Use - Equipment and Facilities.Associated Practices: 533-Pumping Plant, 449-Irrigation Water Management, 430 - Irrigation Pipeline, 610 - Salinity & Sodic Soil Management, 328-Conservation Crop Rotation, 590 Nutrient Management, and 595-Itegrated Pest Management.

Before Situation:

A typical before irrigation situation would normally be an existing inefficient sprinkler or surface irrigation system for vegetable or other crop production system. The existing irrigation system would experience poor, nonuniform irrigation applicatons and significant water losses affecting both water quantity and water quality.

After Situation:

A surface placed microirrigation system is utilized to provide highly efficient irrigation to a field. Water applications are reduced and runoff eliminated. Offsite water quality is improved, and on site water use is reduced. Drip tape will be replaced as operation and maintenance issue as required for proper operation of the system. A typical scenario consists of a 1 acre irrigated field with lateral spacing of 3 feet.

Feature Measure: Acres in System

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $3,064.94

Scenario Cost/Unit: $3,064.94

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Materials						
Pipe, HDPE, smooth wall, weight priced	1379	High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only.	Pound	$3.59	70	$251.30
Micro Irrigation, surface drip tape	2522	Tape is installed above ground for surface drip irrigation on annual crops, includes installation, and connections to the supply and flushing laterals.?? Tape is a minimum of 10 mil thick and has emitters built in.	Feet	$0.11	15972	$1,756.92
Micro Irrigation, screen or disc filter, < 3 inch	2524	Micro Irrigation, small manual flush screen or disc filter, <3 inch nominal size. Includes materials only.	Each	$219.16	1	$219.16
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	2	$607.88

Practice: 441 - Irrigation System, Microirrigation

Scenario: #41 - Small Microirrigation System

Scenario Description:
A small scale surface microirrigation system using drip tape or similar type micro-irrigation material placed on the soil surface to irrigate vegetables or field crops. Typically applied on a 40' by 40' plot, with 24' spaced rows, and emitters on a 12' spacing. Submains break plot into several smaller zones. System includes disk filter and chemical injection for chemigation. Water meter is not included. Natural Resource Concern(s): Insufficient Water - Inefficient use of irrigation water, Degraded Plant Condition - Undesirable plant productivity and health, Water Quality Degradation - Excessive sediment in surface waters, and Inefficient Energy Use - Equipment and facilities. Associated Practices: 533 - Pumping Plant, 449 - Irrigation Water Management, 430 - Irrigation Pipeline, 436 - Irrigation Reservoir, 328 - Conservation Crop Rotation, and 590 - Nutrient Management.

Before Situation:
A field has an inefficient garden-hose based sprinkler irrigation system causing irrigation water loss that impacts water quality and water quantity.

After Situation:
A surface placed microirrigation system is utilized to provide highly efficient irrigation to a small plot. Water applications are reduced and runoff eliminated. Offsite water quality is improved, and on-site water use is reduced.

Feature Measure: Microirrigation area

Scenario Unit: Square Feet

Scenario Typical Size: 1,600.00

Scenario Total Cost: $2,003.43

Scenario Cost/Unit: $1.25

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, Earth, 12 in. x 48 in.	53	Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling	Feet	$1.43	160	$228.80
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	6	$172.26
Materials						
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.29	51	$116.79
Micro Irrigation, drip irrigation system, small scale	2170	An above ground, small scale, micro-irrigation system. Includes miniature emitters, tubes, or applicators placed along a water delivery line. Includes materials and shipping only.	Square Feet	$0.09	1600	$144.00
Micro Irrigation, disk filter, manual flush	2465	Disk filter for Micro irrigation system. Includes filter, plumbing, and connections. Unit is each filter in a filter station that often includes 2 or more filters.	Each	$161.83	1	$161.83
Valve, Double Check Backflow Preventer	2559	Designed for installation on potable water lines to protect against both backsiphonage and backpressure of polluted water into the water supply. Includes materials and shipping only.	Each	$449.87	1	$449.87
Micro-irrigation, chemical injection equipment, small scale	2788	Chemical injection system includes complete 3/4 inch bypass and suction line kit, injector, appurtenances, backflow prevention, 2 gallon chemigation/fertigation tank. No pump needed. Materials and shipping only.	Each	$122.00	1	$122.00
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	2	$607.88

Practice: 441 - Irrigation System, Microirrigation

Scenario: #80 - Hoop House Surface Microirrigation

Scenario Description:

Surface Microirrigation system for 30' x 96' seasonal high tunnel, 24' rows with emmitters on a 12' spacing.

Resource Concerns: Insufficient Water - Inefficient use of irrigation water, Degraded Plant Condition - Undesirable plantproductivity and health, Water Quality Degradation - Excessive sediment in surface waters, and Inefficient Energy Use - Equipment and facilities.Associated Practices: 533-Pumping Plant, 449- Irrigation Water Management, 430 - Irrigation Pipeline, 433 - Irrigation Flow Measrement, 328-Conservation Crop Rotation, and 590 Nutrient Management.

Before Situation:

A field has an inefficient garden-hose based sprinkler irrigation system causing irrigation water loss that impacts water quality and water quantity.

After Situation:

A surface placed microirrigation system is utilized to provide highly efficient irrigation to an area. Water applications are reduced and runoff eliminated. Offsite water quality is improved, and on site water use is reduced.

Feature Measure: Microirrigation area

Scenario Unit: Square Feet

Scenario Typical Size: 2,880.00

Scenario Total Cost: $1,201.08

Scenario Cost/Unit: $0.42

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	4	$114.84
Materials						
Micro Irrigation, drip irrigation system, small scale	2170	An above ground, small scale, micro-irrigation system. Includes miniature emitters, tubes, or applicators placed along a water delivery line. Includes materials and shipping only.	Square Feet	$0.09	2880	$259.20
Micro Irrigation, screen or disc filter, < 3 inch	2524	Micro Irrigation, small manual flush screen or disc filter, <3 inch nominal size. Includes materials only.	Each	$219.16	1	$219.16
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	2	$607.88

Practice: 441 - Irrigation System, Microirrigation

Scenario: #81 - Small Surface Tape System

Scenario Description:
A small scale micro-irrigation system using drip tape or similar type micro-irrigation material placed on the soil surface for vegetables or field crops. Spacing of drip tape or similar type micro irrigation material is based on soil type or row alignment but will typically vary from 18' to 36'. This system typically includes a filter system, PE manifolds fittings, drip tape, etc. This practice applies to systems designed to discharge < 60 gal/hr at each individual discharge point. Does not include Pump, power source, water source. Surface placed drip tape will not meet the 441 practice life and will normally need replacement every year. After first installation drip tape will be replaced as operation and maintenance issue as required for proper operation of the system. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, Degraded Plant Condition - Undesirable plant productivity and health, Water Quality Degradation - Excessive sediment in surface waters, and Inefficient Energy Use -

Equipment and Facilities. Associated Practices: 533-Pumping Plant, 449-Irrigation Water Management, 430 - Irrigation Pipeline, 610 - Salinity & Sodic Soil Management, 328-Conservation Crop Rotation, 590 Nutrient Management, and 595-Itegrated Pest Management.

Before Situation:
A field has an inefficient garden-hose based sprinkler irrigation system causing irrigation water loss that impacts water quality and water quantity.

After Situation:
A surface placed microirrigation system is utilized to provide highly efficient irrigation to a field. Water applications are reduced and runoff eliminated. Offsite water quality is improved, and on site water use is reduced. Drip tape will be replaced as operation and maintenance issue as required for proper operation of the system. A typical scenario consists of a 1,600 square feet irrigated field with lateral spacing of 2 feet.

Feature Measure: Microirrigation area

Scenario Unit: Square Feet

Scenario Typical Size: 1,600.00

Scenario Total Cost: $1,635.79

Scenario Cost/Unit: $1.02

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	4	$114.84
Materials						
Pipe, HDPE, smooth wall, weight priced	1379	High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only.	Pound	$3.59	23	$82.57
Micro Irrigation, disk filter, manual flush	2465	Disk filter for Micro irrigation system. Includes filter, plumbing, and connections. Unit is each filter in a filter station that often includes 2 or more filters.	Each	$161.83	1	$161.83
Micro Irrigation, surface drip tape	2522	Tape is installed above ground for surface drip irrigation on annual crops, includes installation, and connections to the supply and flushing laterals.?? Tape is a minimum of 10 mil thick and has emitters built in.	Feet	$0.11	880	$96.80
Valve, Double Check Backflow Preventer	2559	Designed for installation on potable water lines to protect against both backsiphonage and backpressure of polluted water into the water supply. Includes materials and shipping only.	Each	$449.87	1	$449.87
Micro-irrigation, chemical injection equipment, small scale	2788	Chemical injection system includes complete 3/4 inch bypass and suction line kit, injector, appurtenances, backflow prevention, 2 gallon chemigation/fertigation tank. No pump needed. Materials and shipping only.	Each	$122.00	1	$122.00
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	2	$607.88

Practice: 441 - Irrigation System, Microirrigation

Scenario: #82 - Surface Tape <5 acres

Scenario Description:

A micro-irrigation system using drip tape or similar type micro-irrigation material placed on the soil surface for vegetables or field crops. Spacing of drip tape or similar type micro irrigation material is based on soil type or row alignment but will typically vary from 18' to 36'. This system typically includes a filter system, PE manifolds fittings, drip tape, etc. This practice applies to systems designed to discharge < 60 gal/hr at each individual discharge point. Does not include Pump, power source, water source. Surface placed drip tape will not meet the 441 practice life and will normally need replacement every year. After first installation drip tape will be replaced as operation and maintenance issue as required for proper operation of the system. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, Degraded Plant Condition - Undesirable plantproductivity and health, Water Quality Degradation - Excessive sediment in surface waters, and Inefficient Energy Use - Equipment and Facilities.Associated Practices: 533-Pumping Plant, 449-Irrigation Water Management, 430 - Irrigation Pipeline, 610 - Salinity & Sodic Soil Management, 328-Conservation Crop Rotation, 590 Nutrient Management, and 595-Itegrated Pest Management.

Before Situation:

A typical before irrigation situation would normally be an existing inefficient sprinkler or surface irrigation system for vegetable or other crop production system. The existing irrigation system would experience poor, nonuniform irrigation applicatons and significant water losses affecting both water quantity and water quality.

After Situation:

A surface placed microirrigation system is utilized to provide highly efficient irrigation to a field. Water applications are reduced and runoff eliminated. Offsite water quality is improved, and on site water use is reduced. Drip tape will be replaced as operation and maintenance issue as required for proper operation of the system. A typical scenario consists of a 1/2 acre irrigated field with lateral spacing of 2 feet.

Feature Measure: Acres in System

Scenario Unit: Acres

Scenario Typical Size: 0.50

Scenario Total Cost: $2,435.48

Scenario Cost/Unit: $4,870.96

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	4	$114.84
Materials						
Pipe, HDPE, smooth wall, weight priced	1379	High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only.	Pound	$3.59	49	$175.91
Micro Irrigation, surface drip tape	2522	Tape is installed above ground for surface drip irrigation on annual crops, includes installation, and connections to the supply and flushing laterals.?? Tape is a minimum of 10 mil thick and has emitters built in.	Feet	$0.11	11979	$1,317.69
Micro Irrigation, screen or disc filter, < 3 inch	2524	Micro Irrigation, small manual flush screen or disc filter, <3 inch nominal size. Includes materials only.	Each	$219.16	1	$219.16
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	2	$607.88

Practice: 442 - Sprinkler System

Scenario: #1 - Center Pivot System, greater than 60 acres

Scenario Description:

Installation of a low pressure center pivot system for an irrigated area greater than 60 acres. Resource concerns include: Soil Erosion (Concentrated flow erosion e.g. irrigation induced), Insufficient Water (Inefficient use of irrigation water), Water Quality Degradation (Excess nutrients in surface and ground waters, Excessive salts in surface and ground waters, Excess pathogens and chemicals from manure, bio-solids or compost applications). Associated Practices: Irrigation Pipeline (430), Pumping Plant (533), Irrigation Water Management (449)

Before Situation:

A 160 acre field is irrigated with a traveling gun system. Application of irrigation water is inefficient and non-uniform. Irrigation water is typically over applied in some parts of the field and under applied in others. Deep percolation from the excess irrigation delivers excess nutrients, salts, and chemicals to the ground water. Runoff from the field contains excess nutrients and degrades the receiving waters. Irrigation induced erosion is excessive.

After Situation:

The existing irrigation system is converted to a low pressure center pivot irrigating 122 acres. Corners are converted to non-irrigated cropland. The pivot is configured with pressure regulators and low pressure sprinklers on drops that has a coefficient of uniformity above 85%. Irrigation water is efficiently and uniformly applied to maintain adequate soil water for the desired level of plant growth. Deep percolation and field runoff is eliminated assuming proper scheduling and there are no excess nutrients, salts or pathogens delivered to the receiving waters. Irrigation induced runoff is eliminated. This center pivot scenario includes all hardware from the pivot point, including the concrete pad the pivot is placed on.

Feature Measure: Area Irrigated by the Center Pivot L

Scenario Unit: Acres

Scenario Typical Size: 122.00

Scenario Total Cost: $98,348.01

Scenario Cost/Unit: $806.13

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Irrigation, Center pivot system with appurtenances, fixed cost portion	317	Fixed cost portion of the center pivot system with appurtenances. This portion includes the following items: pivot point, pipe, towers, pad, controls, sprinklers.	Each	$5,281.01	1	$5,281.01
Irrigation, Center pivot system with appurtenances, variable cost portion	318	Variable cost portion of the center pivot system with appurtenances. This portion includes the following items: pivot point, pipe, towers, pad, controls, sprinklers.	Feet	$71.59	1300	$93,067.00

Practice: 442 - Sprinkler System

Scenario: #2 - Solid Set System

Scenario Description:

A solid set irrigation system.Resource concerns include: Soil Erosion (Concentrated flow erosion e.g. irrigation induced), Insufficient Water (Inefficient use of irrigation water), Water Quality Degradation (Excess nutrients in surface and ground waters, Excessive salts in surface and ground waters, Excess pathogens and chemicals from manure, bio-solids or compost applications)Associated Practices: Irrigation Pipeline (430), Pumping Plant (533), Irrigation Water Management (449)

Before Situation:

The typical installation will be on cropland with some existing inefficient irrigation. The farm is typically producing specialty crops, such as cranberries, fruits, or fresh vegetables. Scenario assumes cranberry bed 150' wide by 1000' long

After Situation:

The system is installed on 3.5 acres or less. The installed solid set system has 3-4 inch pipe sizes and sprinklers set 30 - 50 ft apart. Improved distribution uniformity and irrigation efficiency will result.

Feature Measure: Area of Irrigation System

Scenario Unit: Acres

Scenario Typical Size: 3.50

Scenario Total Cost: $19,200.00

Scenario Cost/Unit: $5,485.71

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Irrigation, Handline, w/Appurtenances	321	Handline irrigation system that includes pipe, sprinklers, connections and appurtenances. Includes materials only.	Feet	$6.40	3000	$19,200.00

Practice: 442 - Sprinkler System

Scenario: #4 - Renovation of Existing Sprinkler System

Scenario Description:

Center Pivot sprinkler systems are used in large crop fields with fairly regular field borders and flat topography. The scenario involves changing nozzles on center pivot irrigation systems to low-pressure systems to improve efficiency of water use and reduce energy use. This scenario is intended for cropland areas where the objective is water and energy conservation. A typical scenario assumes a 1300 LF span, including end booms renozzled with low-pressure nozzles.Resource concerns include: Soil Erosion (Concentrated flow erosion e.g. irrigation induced), Insufficient Water (Inefficient use of irrigation water), Water Quality Degradation (Excess nutrients in surface and ground waters, Excessive salts in surface and ground waters, Excess pathogens and chemicals from manure, bio-solids or compost applications), Inefficient Energy Use (Equipment and facilities e.g. pumping)Associated Practices: Irrigation Pipeline (430), Pumping Plant (533), Irrigation Water Management (449)

Before Situation:

A center pivot system has high pressure sprinklers. The nozzles are worn and water is applied non-uniformly. Water runs off the field and degrades the receiving waters. Deep percolation in some parts of the field degrades the ground water quality. The runoff from the field causes soil erosion. The high pressure requirement for the system requires excess energy use.

After Situation:

A Center Pivot sprinkler system with a span of 1300 linear feet is re-nozzled with low-pressure nozzles. The irrigation water is applied efficiently and uniformly to maintain adequate soil moisture for optimum plant growth. Runoff and deep percolation are eliminated, and the surface and ground water is no longer degraded. The irrigation induced soil erosion caused by runoff is also eliminated. The lower pressure requirements of the sprinklers reduces the energy used by the pump.

Feature Measure: Length of Lateral Retrofitted

Scenario Unit: Feet

Scenario Typical Size: 1,300.00

Scenario Total Cost: $9,899.32

Scenario Cost/Unit: $7.61

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Aerial lift, telescoping bucket	1893	Aerial lift, bucket truck or cherry picker, typical 40' boom. Equipment only.	Hours	$45.71	8	$365.68
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	8	$242.88
Materials						
Irrigation, Sprinkler Package, Renozzle or Retrofit, with drops and pressure regulators	1480	Sprinkler Package - Rennovation including sprinkler nozzle addition, and/or replacement, including new pressure regulators and drops.	Feet	$6.83	1300	$8,879.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08

Practice: 442 - Sprinkler System

Scenario: #5 - Renovation of Cranberry bed solid set sprinkler system

Scenario Description:

An existing cranberry bed solid set sprinkler irrigation system is in place which does not meet distribution uniformity standards.Resource concerns include: Soil Erosion (Concentrated flow erosion e.g. irrigation induced), Insufficient Water (Inefficient use of irrigation water), Water Quality Degradation (Excess nutrients in surface and ground waters, Excessive salts in surface and ground waters, Excess pathogens and chemicals from manure, bio-solids or compost applications)Associated Practices: Irrigation Pipeline (430), Pumping Plant (533), Irrigation Water Management (449)

Before Situation:

The existing laterals and sprinklers are in good condition, but the spacing is too wide to meet sprinkler distribution uniformity standards. The typical bed is 150' wide by 1000' long and is irrigated using two laterals

After Situation:

A new, third lateral is added to the bed and the lateral spacing is adjusted with the appropriate overlap to meet sprinkler distribution uniformity standards.

Feature Measure: Length Lateral Installed

Scenario Unit: Feet

Scenario Typical Size: 1,000.00

Scenario Total Cost: $7,162.72

Scenario Cost/Unit: $7.16

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	8	$350.96
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Materials						
Irrigation, Handline, w/Appurtenances	321	Handline irrigation system that includes pipe, sprinklers, connections and appurtenances. Includes materials only.	Feet	$6.40	1000	$6,400.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08

Practice: 442 - Sprinkler System

Scenario: #18 - Fertigation Retrofit, 80 gph Pump

Scenario Description:
Integrating fertigation application technology onto a center pivot system for efficient placement of chemicals along the length of the system. Pumping capacity of the center pivot system is between 800 gpm to 1200 gpm of water. The resource concern is Water Quality Degradation (Excess nutrients in surface and ground waters).

Before Situation:
A center pivot system has low pressure sprinklers. Deep percolation of chemicals in some parts of the field degrades the ground water quality.

After Situation:
A Center Pivot sprinkler system has fertigation components added to the system which increases chemical application efficiency and uniformity utilizing a modern center pivot system. The chemicals are applied efficiently and uniformly to maintain optimum plant growth. Fertigation provides nutrients to the crop when the crop needs them and allows nutrients to be applied longer into the growing season. Deep percolation is eliminated and the ground water is no longer degraded.

Feature Measure: Each system retrofitted

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $4,445.05

Scenario Cost/Unit: $4,445.05

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	18	$789.66
Materials						
Valve, Chemigation, < 12 inch dia.	2369	Chemigation valve less than 12 inch diameter for controlling injection of chemicals into irrigation systems. Materials only.	Each	$650.70	1	$650.70
Irrigation injection pump assembly 80 GPH	2647	Irrigation system injection pump assembly for chemical or fertilizer injection. Typical rate of 80 gph. Material only.	Each	$2,640.53	1	$2,640.53
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	2	$364.16

Practice: 442 - Sprinkler System

Scenario: #19 - Fertigation Retrofit, 30 gph Pump

Scenario Description:
Integrating fertigation application technology onto a center pivot system for efficient placement of chemicals along the length of the system. Pumping capacity of the center pivot system is between 300 gpm to 800 gpm of water. The resource concern is Water Quality Degradation (Excess nutrients in surface and ground waters).

Before Situation:
A center pivot system has low pressure sprinklers. Deep percolation of chemicals in some parts of the field degrades the ground water quality.

After Situation:
A Center Pivot sprinkler system has fertigation components added to the system which increases chemical application efficiency and uniformity utilizing a modern center pivot system. The chemicals are applied efficiently and uniformly to maintain optimum plant growth. Fertigation provides nutrients to the crop when the crop needs them and allows nutrients to be applied longer into the growing season. Deep percolation is eliminated and the ground water is no longer degraded.

Feature Measure: Each system retrofitted

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $4,048.15

Scenario Cost/Unit: $4,048.15

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	18	$789.66
Materials						
Valve, Chemigation, < 12 inch dia.	2369	Chemigation valve less than 12 inch diameter for controlling injection of chemicals into irrigation systems. Materials only.	Each	$650.70	1	$650.70
Irrigation injector pump assembly 30 GPH	2648	Irrigation system injection pump assembly for chemical and fertilizer injection. Typical rate of 30 gph. Material only.	Each	$2,243.63	1	$2,243.63
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	2	$364.16

Practice: 442 - Sprinkler System

Scenario: #30 - Linear Move System

Scenario Description:

Installation of a linear or lateral move sprinkler system with sprinklers on drops with or without drag hoses to improve irrigation efficiency and reduce soil erosion.Resource concerns include: Soil Erosion (Concentrated flow erosion e.g. irrigation induced), Insufficient Water (Inefficient use of irrigation water), Water Quality Degradation (Excess nutrients in surface and ground waters, Excessive salts in surface and ground waters, Excess pathogens and chemicals from manure, bio-solids or compost applications), Inefficient Energy Use (Equipment and facilities e.g. pumping)Associated Practices: Irrigation Pipeline (430), Pumping Plant (533), Irrigation Water Management (449)Payment rate is figured per foot of installed hardware length.

Before Situation:

A 76 acre field is flood irrigated. Application of irrigation water is inefficient and non-uniform. Irrigation water is typically over applied in some parts of the field, and under applied in others. Deep percolation from the excess irrigation delivers excess nutrients salts, and chemicals to the ground water. Runoff from the field contains excess nutrients and degrades the receiving waters. Irrigated induced erosion is excessive.

After Situation:

A typical unit is approximately 76 acres in size with the sprinkler system up to 1280 feet in length with drop tubes that have a minimum of 30' spacing. The new irrigation system has a coefficient of uniformity above 85%. Irrigation water is efficiently and uniformly applied to maintain adequate soil water for the desired level of plant growth. Deep percolation and field runoff is eliminated and there are no excess nutrients, salts or pathogens delivered to the receiving waters. Irrigation induced runoff is eliminated.

Feature Measure: Length of Linear Move Lateral

Scenario Unit: Feet

Scenario Typical Size: 1,280.00

Scenario Total Cost: $170,887.78

Scenario Cost/Unit: $133.51

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Linear Move System with appurtenances	322	Linear/lateral move system including central tower, lateral towers, pipes, sprinklers, and controllers.	Acres	$2,223.61	76	$168,994.36
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	2	$364.16
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 442 - Sprinkler System

Scenario: #31 - Traveling Gun System, 2 to 3 inch Hose

Scenario Description:

A portable big gun system used to apply waste water from animal feeding operations.This traveling big gun unit includes a sprinkler, towable cart, 1000??? or more of PE hard hose, a self propelled reel that moves the sprinkler toward the reel during operation. The reel attaches to a mainline with appropriately designed towpath width. The scenario describes an irrigation system that is typical to confined animal feeding operations. Resource concerns: Soil Erosion (Concentrated flow erosion, e.g. overflowing waste storage) and Water Quality Degradation (Excess nutrients in surface and ground waters, Excessive salts in surface and ground waters, Excess pathogens and chemicals from liquid manure)Associated Practices: Irrigation Pipeline (430), Pumping Plant (533), Irrigation Water Management (449), Conservation Crop Rotation (328), Cover Crop (340), Nutrient Management (590), Waste Utilization (633), Manure Transfer (634)

Before Situation:

A confined, animal operation has a waste management system that exceeds its capacity, or a operation that does not have a waste management system in place. The inefficiency of the existing system or the lack of a waste management system has an impact on the soil and water quality. Animal waste runs off and degrades the receiving waters.

After Situation:

The big gun applies animal manure in an appropriate quantity and location that eliminates both runoff of the manure and deep percolation of excess nutrients, salts, and pathogens.The big gun system is typically located on 50 acres or less of hay/pasture land, or 100 acres or less of cropland. The system includes a large irrigation gun with 1??? to 1????? orifice mounted onto a movable cart. 1000??? or more flexible 3??? PE pipe is attached to the cart on one end and a large reel on the other end. The reel serves as storage are for the pipe as the cart moves back to the reel. The reel is turned by a small engine which gradually pulls the flexible pipe and cart back to the reel/base.

Feature Measure: Number of Traveling Gun Systems

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $25,774.65

Scenario Cost/Unit: $25,774.65

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Irrigation, Traveling Gun System, > 2 to 3 inch Nominal size hose	1479	Irrigation, Traveling Gun System with 2.3-to-3-inch Nominal size hose with appurtenances. This includes the sprinkler gun, traveler cart, hard hose, reel, connections, and controls. Normal hose length 1000'.	Inch Diameter	$8,591.55	3	$25,774.65

Practice: 442 - Sprinkler System

Scenario: #36 - VRI System - Zone

Scenario Description:

'Integrating variable application technology onto a center pivot system for precision zone placement of water along the length of the system for water savings. A variable application over the field based either 1) EM mapping and a grid system, 2) previous year(s) harvest yield maps or 3) soil properties, or combination of each. This scenario is to renovate a previously irrigation system with proper modular components and pressure regulating devices, with GPS for field location and new control panel to update existing panel, along with other needed components to install a VRI system for more effective utilization of water. Resource concerns include: Soil Erosion (Concentrated flow erosion e.g. irrigation induced), Insufficient Water (Inefficient use of irrigation water), Water Quality Degradation (Excess nutrients in surface and ground waters, Excessive salts in surface and ground waters, Excess pathogens and chemicals from manure, bio-solids or compost applications), Inefficient Energy Use (Equipment and facilities e.g. pumping), and protection of wetland areas enrolled in conservation program and other environemental sesititve areas. Associated Practices: Irrigation Pipeline (430), Pumping Plant (533), Irrigation Water Management (449), Wetland Restoration (657), Wetland Enhancement (658) Wetland Creation (659)'

Before Situation:

A center pivot or lateral move system has low pressure sprinklers. Water runs off the field and degrades the receiving waters. Deep percolation in some parts of the field degrades the ground water quality. The runoff from the field causes soil erosion. The high pressure requirement for the system requires excess energy use.

After Situation:

A Center Pivot or Linear Move sprinkler system with a span of 1300 linear feet is has modular VRI components added to the system which increases irrigation efficiency and uniformity utilizing a modern center pivot system resulting in water savings. The irrigation water is applied efficiently and uniformly to maintain adequate soil moisture for optimum plant growth. Runoff and deep percolation are eliminated, and the surface and ground water is no longer degraded. The irrigation induced soil erosion caused by runoff is also eliminated. The lower pressure requirements of the sprinklers reduces the energy used by the pump.

Feature Measure: Length of Center Pivot or Laterial w

Scenario Unit: Linear Feet

Scenario Typical Size: 1,300.00

Scenario Total Cost: $65,823.90

Scenario Cost/Unit: $50.63

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Aerial lift, telescoping bucket	1893	Aerial lift, bucket truck or cherry picker, typical 40' boom. Equipment only.	Hours	$45.71	1	$45.71
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	24	$1,052.88
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	24	$689.04
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	24	$728.64
Materials						
Center Pivot VRI, Zone Control	2726	Center pivot system with variable rate irrigation using zone control technology. Includes controller, sensors, GPS Unit, pressure regulating valve between pump and pivot, tubing, flow control nozzles, and expansion nodes.	Linear Feet	$48.11	1300	$62,543.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 442 - Sprinkler System

Scenario: #39 - Center Pivot System with VRI

Scenario Description:

Upgrading existing irrigation system or installing new irrigation system with a more uniform and efficient (vendor provided and installed modular system) Center Pivot system for the purpose of protecting water quality and utilizing water effectively. Integrating variable application technology onto a center pivot system for precision zone placement of water along the length of the system for water savings. A variable application over the field based either 1) EM mapping and a grid system, 2) previous year(s) harvest yield maps or 3) soil properties, 4) avoidance areas or combination of each. This scenario is a new system to replace an existing gravity system, with the proper components, nozzles, and pressure regulating devices, along with other needed components for installation of a VRI system for more effective utilization of water. Resource concerns include: Soil Erosion (Concentrated flow erosion e.g. irrigation induced), Insufficient Water (Inefficient use of irrigation water), Water Quality Degradation (Excess nutrients in surface and ground waters, Excessive salts in surface and ground waters, Excess pathogens and chemicals from manure, bio-solids or compost applications), Inefficient Energy Use (Equipment and facilities e.g. pumping), and protection of wetland areas enrolled in conservation program and other environmentally sensititve areas. Associated Practices: Irrigation Pipeline (430), Pumping Plant (533), Irrigation Water Management (449), Wetland Restoration (657), Wetland Enhancement (658) Wetland Creation (659)

Before Situation:

Application of irrigation water, manure, or wastewater is inefficient and non-uniform. Irrigation water is typically over applied in some parts of the field, and under applied in others. Deep percolation from the excess irrigation delivers excess nutrients, salts, and chemicals to the ground water and receiving stream. Additional energy input needed to apply sufficient water or nutrients to entire field. Irrigated induced erosion is excessive. Water runs off the field and degrades the receiving waters. Deep percolation in some parts of the field degrades the ground water quality. The runoff from the field causes soil erosion.

After Situation:

A new Center Pivot or Linear Move sprinkler system with a span of 1300 linear feet and a modular VRI system which increases irrigation efficiency and uniformity utilizing a modern center pivot system resulting in water savings. The irrigation water is applied efficiently and uniformly to maintain adequate soil moisture for optimum plant growth. Runoff and deep percolation are eliminated, and the surface and ground water is no longer degraded. The irrigation induced soil erosion caused by runoff is also eliminated. The lower pressure requirements of the sprinklers reduces the energy used by the pump.

Feature Measure: Area Irrigated by the Center Pivot L

Scenario Unit: Acres

Scenario Typical Size: 122.00

Scenario Total Cost: $164,519.65

Scenario Cost/Unit: $1,348.52

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Irrigation, Center pivot system with appurtenances, fixed cost portion	317	Fixed cost portion of the center pivot system with appurtenances. This portion includes the following items: pivot point, pipe, towers, pad, controls, sprinklers.	Each	$5,281.01	1	$5,281.01
Irrigation, Center pivot system with appurtenances, variable cost portion	318	Variable cost portion of the center pivot system with appurtenances. This portion includes the following items: pivot point, pipe, towers, pad, controls, sprinklers.	Feet	$71.59	1300	$93,067.00
Flow Meter, with Electronic Index	1452	10 inch Turbine Irrigation flow meter, with Electronic Index, Rate and Volume, permanently installed. Materials only.	Each	$3,628.64	1	$3,628.64
Center Pivot VRI, Zone Control	2726	Center pivot system with variable rate irrigation using zone control technology. Includes controller, sensors, GPS Unit, pressure regulating valve between pump and pivot, tubing, flow control nozzles, and expansion nodes.	Linear Feet	$48.11	1300	$62,543.00

Practice: 442 - Sprinkler System

Scenario: #49 - Center Pivot System, 60 acres and smaller

Scenario Description:

Installation of a low pressure center pivot system for an irrigated area less than 60 acres. Resource concerns include: Soil Erosion (Concentrated flow erosion e.g. irrigation induced), Insufficient Water (Inefficient use of irrigation water), Water Quality Degradation (Excess nutrients in surface and ground waters, Excessive salts in surface and ground waters, Excess pathogens and chemicals from manure, bio-solids or compost applications). Associated Practices: Irrigation Pipeline (430), Pumping Plant (533), Irrigation Water Management (449)

Before Situation:

A 40 acre field is irrigated with a traveling gun system. Application of irrigation water is inefficient and non-uniform. Irrigation water is typically over applied in some parts of the field and under applied in others. Deep percolation from the excess irrigation delivers excess nutrients, salts, and chemicals to the ground water. Runoff from the field contains excess nutrients and degrades the receiving waters. Irrigation induced erosion is excessive.

After Situation:

The existing irrigation system is converted to a low pressure center pivot irrigating 30 acres. Corners are converted to non-irrigated cropland. The pivot is configured with pressure regulators and low pressure sprinklers on drops that has a coefficient of uniformity above 85%. Irrigation water is efficiently and uniformly applied to maintain adequate soil water for the desired level of plant growth. Deep percolation and field runoff is eliminated assuming proper scheduling and there are no excess nutrients, salts or pathogens delivered to the receiving waters. Irrigation induced runoff is eliminated. This center pivot scenario includes all hardware from the pivot point, including the concrete pad the pivot is placed on.

Feature Measure: Area Irrigated by the Center Pivot L

Scenario Unit: Acres

Scenario Typical Size: 30.00

Scenario Total Cost: $51,384.97

Scenario Cost/Unit: $1,712.83

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Irrigation, Center pivot system with appurtenances, fixed cost portion	317	Fixed cost portion of the center pivot system with appurtenances. This portion includes the following items: pivot point, pipe, towers, pad, controls, sprinklers.	Each	$5,281.01	1	$5,281.01
Irrigation, Center pivot system with appurtenances, variable cost portion	318	Variable cost portion of the center pivot system with appurtenances. This portion includes the following items: pivot point, pipe, towers, pad, controls, sprinklers.	Feet	$71.59	644	$46,103.96

Practice: 442 - Sprinkler System

Scenario: #70 - Small Solid Set, Above Ground Laterals

Scenario Description:

A permanent solid set irrigation system with buried submains and above ground laterals such as polyethylene flexible tubing. The typical system is installed on a 2 acre orchard or nursery, with plant spacing of 15 feet x 22 feet. Laterals are spaced 22 feet apart, however other spacing for this scenario apply. This system utilizes sprayers or minisprinklers at each tree or plant. This system typically includes a filter system, PE tubing laterals, PVC manifolds, and submains, valves, fittings, and emitters. System installation does not include a flowmeter, Pump, Power source, Irrigation Water Conveyance to the irrigated field, or Water source (well or reservoir). Resource concerns include: Soil Erosion (Concentrated flow erosion e.g. irrigation induced), Insufficient Water (Inefficient use of irrigation water), Water Quality Degradation (Excess nutrients in surface and ground waters, Excessive salts in surface and ground waters, Excess pathogens and chemicals from manure, bio-solids or compost applications) Associated Practices: Irrigation Pipeline (430), Pumping Plant (533), Irrigation Water Management (449).

Before Situation:

The typical installation will be on an orchard, nursery, or vineyard with an existing inefficient irrigation system.

After Situation:

An irrigation system is utilized to provide improved distribution uniformity and irrigation efficiency to an orchard, nursery, or vineyard. Runoff and water applications are reduced, resulting in offsite water quality improvement and on site water use reduction.

Feature Measure: Area in Irrigation System

Scenario Unit: Acres

Scenario Typical Size: 2.00

Scenario Total Cost: $6,702.58

Scenario Cost/Unit: $3,351.29

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, Earth, 12 in. x 48 in.	53	Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling	Feet	$1.43	295	$421.85
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	4	$114.84
Materials						
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.29	215	$492.35
Micro Irrigation, emitters or sprays and tubing	1489	Emitters or sprays that are installed above ground for micro or drip irrigation. Includes installation and connections to the supply and flushing laterals. Tubing for the emitters is included in this item.	Feet	$1.21	3835	$4,640.35
Micro Irrigation, screen or disc filter, < 3 inch	2524	Micro Irrigation, small manual flush screen or disc filter, <3 inch nominal size. Includes materials only.	Each	$219.16	1	$219.16
Valve, Double Check Backflow Preventer	2559	Designed for installation on potable water lines to protect against both backsiphonage and backpressure of polluted water into the water supply. Includes materials and shipping only.	Each	$449.87	1	$449.87
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	2	$364.16

Practice: 443 - Irrigation System, Surface and Subsurface

Scenario: #37 - Ebb and Flow Benches

Scenario Description:
Water tight benches, that are housed within the interior of a greenhouse, are installed that re-circulates (ebb and flow) water for irrigation purposes. Typical system consist of bay with three benches 4 feet wide and 100 feet long (1200 sq ft). The bench is flooded then slowly drained to allow water to upflux of water into potted plants located on the bench. This type of drip irrigation system utilizes a buried supply manifold with automated zone control valves and a buried drainage manifold. This permanent subsurface irrigation system will include a filter station, flow meter, backflow prevention device, automated control box or timer, both a supply and drainage manifold, sump and numerous types of water control valves. This scenario includes all material and labor to install the benches filter and automation system. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, Degraded Plant Condition - Undesirable plant productivity and health, Water Quality Degradation Excessive leaching of nutrients into ground and surface waters, and Inefficient Energy Use - Equipment and facilities. Associated Practices: 430 - Irrigation Pipeline, 436 - Irrigation Reservoir, 533-Pumping Plant, 620-Underground Outlet

Before Situation:
An existing inefficient microirrigation or sprinkler irrigation system in a greenhouse. The existing irrigation system experiences poor, non-uniform irrigation applications and significant water losses affecting both water quantity and water quality.

After Situation:
This highly efficient subsurface irrigation system provides irrigation water directly to the plant root zone by capillary action and recirculates excess water for reuse, eliminating application losses resulting from water leaching through the pot during irrigation or being applied to areas without pots.

Feature Measure: Square Feet

Scenario Unit: Square Feet

Scenario Typical Size: 1,200.00

Scenario Total Cost: $18,457.80

Scenario Cost/Unit: $15.38

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Irrigation Flood Bench system	2231	Sliding benches or troughs used for potted plant irrigation. Distribution system is included in benches. Includes materials and equipment costs.	Square Feet	$14.55	1200	$17,460.00
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	8	$350.96
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Materials						
Micro Irrigation, control valves and timers	1485	Automatic controller and timer, to turn on and off the sets for micro irrigation, and valves. Based on control unit, not number of valves controlled.	Each	$417.16	1	$417.16

Practice: 443 - Irrigation System, Surface and Subsurface

Scenario: #38 - Flood Floor Irrigation

Scenario Description:
The scenario consists of a concrete floor and under floor water distribution system. The plants receive water from the flooded floor through the root zone. Only needed water is taken up by the soil medium. After irrigation is complete, all water is cycled to the holding tank and is reused for the next irrigation cycle. For pumps - use CPS 533 - Pumping Plant , for piping use CPS 430 - Irrigation Pipeline. Based on flood floor design

Before Situation:
The greenhouse plants are watered by hand or by sprinkler system. Water drips onto the floor and sinks into the earthen floor, runs off or evaporates. Water is lost to the plants and can become contaminated with fertilizers or pesticides.

After Situation:
Greenhouse irrigation water is supplied by a Flood-Floor irrigation system. Water is taken up by the soil medium. All remaining water is recycled for reuse. No water is wasted or contaminated.

Feature Measure: Square foot of flooded area

Scenario Unit: Square Feet

Scenario Typical Size: 21,600.00

Scenario Total Cost: $205,372.93

Scenario Cost/Unit: $9.51

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	300	$150,375.00
Micro Irrigation, chemical injection equipment	1987	Chemical Injector Pump, plus chemigation check valve, injector ports, and appurtenances, Installation included.	Each	$2,151.39	1	$2,151.39
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	48	$2,105.76
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	128	$3,674.88
Materials						
Tank, Poly Enclosed Storage, >1,000	1075	Water storage tanks. Includes materials and shipping only.	Gallons	$1.18	14000	$16,520.00
Tank, Float Valve Assembly	1077	Float Valve, Stem, Swivel, Float Ball	Each	$102.79	1	$102.79
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.29	12885.8	$29,508.48
Micro Irrigation, control valves and timers	1485	Automatic controller and timer, to turn on and off the sets for micro irrigation, and valves. Based on control unit, not number of valves controlled.	Each	$417.16	2	$834.32
Micro Irrigation, screen filter, < 100 gpm	1617	Screen filter for Micro Irrigation used in small systems. Includes filter. No controls are included or needed.	Each	$100.31	1	$100.31

Practice: 447 - Irrigation and Drainage Tailwater Recovery

Scenario: #23 - Delta Tail Water Pit

Scenario Description:

A recovery pit is constructed to temporality store the excess irrigation water and create a pumping pool so that the excess water can be recovered and reused. Typical pit size is trapezoidal ditch with 14ft bottom x 10ft depth x 1750 ft length with 2:1 side slopes. The total yardage of earthwork is 22,037 cy. Construction is typically done with either tractors and pans or with dozer and excavator.

Before Situation:

Excess irrigation water collects at lower ends of field and backs up into crops and causes plant stress or causes erosion and travels off farm in a drainage ditch causing water quality issues in lower watersheds. Excess irrigation water and runoff during the off season is not capture and unavailable for use.

After Situation:

Excess irrigation water is collected and directed into a recovery system where the water can be recycled and reused for irrigation. Sedimentation has a chance to settle out of the water allowing for less sediment to travel down stream. All runoff has an opportunity to be collected.

Feature Measure: Excavated Material

Scenario Unit: Cubic Yards

Scenario Typical Size: 22,307.00

Scenario Total Cost: $37,325.95

Scenario Cost/Unit: $1.67

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, common earth, side cast, large equipment	1227	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$1.61	22037	$35,479.57
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	2	$1,846.38

Practice: 447 - Irrigation and Drainage Tailwater Recovery

Scenario: #24 - Tailwater Collection Structure

Scenario Description:
A collection structure designed and constructed to efficiently direct excess tailwater from a field and deliver into a tailwater recovery ditch or tailwater recovery pit. Typical installation will be a flashboard riser or drop inlet structure placed at edge of field through an earthen berm to direct tailwater into tailwater recovery system. Resource concern(s): Water quality, inefficient use of water. Cost estimate based on 18' weir and 55' long, 15' diameter barrel.

Before Situation:
During irrigation, tailwater exits the field in an uncontrolled manner and is being lost downstream and cannot be recovered for future use.

After Situation:
Tailwater is collected through structure at a prescribed location and directed into tailwater recovery system for re-use. Other associated practices may include Irrigation reservoir (436), Irrigation and Drainage Tailwater Recovery Pit (447), Surface Drain, Main or Lateral (608), Surface Drain, Field Ditch (607)

Feature Measure: weir dia (in) x barrel length (ft)

Scenario Unit: Inch-Foot

Scenario Typical Size: 990.00

Scenario Total Cost: $4,602.81

Scenario Cost/Unit: $4.65

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	100	$401.00
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	20	$125.00
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	2	$261.02
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	3	$131.61
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	6	$172.26
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	2	$80.26
Materials						
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.29	623.7	$1,428.27
Steel, Angle, 2 1/2 in. x 2 1/2 in. x 1/4 in.	1372	Materials: Angle, 2 1/2 inch x 2 1/2 inch x 1/4 inch. Meets ASTM A36	Feet	$4.19	10	$41.90
Lumber, planks, posts and timbers, treated	1609	Treated dimension lumber with nominal thickness greater than 2 inches. Includes lumber and fasteners. Does not include labor.	Board Feet	$3.53	32	$112.96
Pipe, PVC, dia. => 18 in., weight priced	1958	Polyvinyl Chloride (PVC) Pipe priced by the weight of the pipe materials for pipes with diameters equal to or greater than 18 inch. Materials only.	Pound	$2.41	79	$190.39
Coupling, PVC, Tee, 18x15, SDR 51	2365	Materials: - Tee, 18 inch x 15 inch - PVC - SDR 51 - ASTM F2658	Each	$711.43	1	$711.43
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 449 - Irrigation Water Management

Scenario: #2 - Basic IWM, greater than 30 acres

Scenario Description:

A low Intensity irrigation water management system for producers using a checkbook method (crop grown, soil moisture conditions prior to irrigation, dates of irrigation start and stop, depths of irrigation applied, duration of irrigations, and amount of rainfall). For a typical scenario, soil moisture is determined by the feel method, depth of irrigation based on rain gauge data or irrigation system runtime information, records are kept on paper copies, and calculations are made by hand. Resource Concerns: Insufficient Water Supply-Inefficient use of irrigation water; Degraded Plant Condition-Undesirable plant productivity and health, and Inefficient Energy Use-Equipment and facilities.Associated Practices: 442-Irrigation System Sprinkler

Before Situation:

The irrigator decides when to irrigate based on general crop or soil appearance or limited soil moisture monitoring. System run times are based on past apparent success. The typical irrigated field is a 90 acre corn field with a sprinkler irrigation system.

After Situation:

Irrigations are scheduled based on measured crop water requirements. Records are used to evaluate results of past irrigation events and influence future irrigations. The irrigator keeps records of soil moisture, crop water use, rainfall amounts and irrigation timing and amounts. At the end of the irrigation season all the data has been reviewed and evaluated. Improvements planned for the next season have been determined.

Feature Measure: Irrigated Area Managed

Scenario Unit: Acres

Scenario Typical Size: 90.00

Scenario Total Cost: $1,784.88

Scenario Cost/Unit: $19.83

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	32	$1,555.20

Practice: 449 - Irrigation Water Management

Scenario: #4 - Intermediate IWM, greater than 30 acres

Scenario Description:

A medium intensity irrigation water management system for producers using a checkbook method (crop grown, soil moisture conditions prior to irrigation, dates of irrigation start and stop, depths of irrigation applied, duration of irrigations, and amount of rainfall). For a typical scenario, soil moisture is determined by in-field moisture sensors with manual downloads. Irrigation depths are recorded from a rain gauge or pumping records. Records are input manually into an irrigation scheduling computer program. Resource Concerns: Insufficient Water Supply-Inefficient use of irrigation water; Degraded Plant Condition-Undesirable plant productivity and health, and Inefficient Energy Use-Equipment and facilities.Associated Practices: 441-Irrigation System Microirrigation, 442-Irrigation System Sprinkler

Before Situation:

The farmer decides when to irrigate based on general crop or soil appearance or limited soil moisture monitoring. System run times are based on past apparent success. The typical irrigated field is a 90 acre corn field with a sprinkler irrigation system.

After Situation:

Irrigations are scheduled based on measured crop water requirements. Records are used to evaluate results of past irrigation events and influence future irrigations. The irrigator keeps records of soil moisture, crop water use, rainfall amounts and irrigation timing and amounts. At the end of the irrigation season all the data has been reviewed and evaluated. Improvements planned for the next season have been determined.

Feature Measure: Irrigated Area Managed

Scenario Unit: Acres

Scenario Typical Size: 90.00

Scenario Total Cost: $2,403.36

Scenario Cost/Unit: $26.70

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	16	$459.36
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	40	$1,944.00

Practice: 449 - Irrigation Water Management

Scenario: #5 - IWM, less than or equal to 30 acres

Scenario Description:
A Basic, Intermediate or High intensity irrigation water management system for producers using a checkbook method with advanced methods of determining irrigation water applied, and estimating crop evapotranspiration, monitoring field soil moisture, or monitoring crop temperature stress. Typical methods include flow measurement, daily record keeping, and use of real-time evapotranspiration estimates (such as those provided dedicated weather stations) and/or soil moisture sensors with automated data logging to monitor field soil moisture content and/or crop temperature. For this scenario, soil moisture is determined by automated soil moisture monitoring stations equipped with telemetry data. Irrigation amounts are recorded from control settings and system runtime. Telemetry data is automatically sent to a computer with irrigation software. Irrigator also receives real time data via mobile phone applications. Some data such as total water applied may be entered into computer software manually.Resource Concerns: Insufficient Water Supply-Inefficient use of irrigation water; Degraded Plant Condition-Undesirable plant productivity and health, and Inefficient Energy Use-Equipment and facilities.Associated Practices: 441-Irrigation System Microirrigation, 442-Irrigation System Sprinkler

Before Situation:
The farmer decides when to irrigate based on general crop or soil appearance or limited soil moisture monitoring. System run times are based on past apparent success.

The typical irrigated field is a 30 acre corn field with a sprinkler irrigation system.

After Situation:
Irrigations are scheduled based on measured crop water requirements. Records are used to evaluate results of past irrigation events and influence future irrigations. The irrigator keeps records of soil moisture, crop water use, rainfall amounts and irrigation timing and amounts. At the end of the irrigation season all the data has been reviewed and evaluated. Improvements planned for the next season have been determined.

Feature Measure: Each Irrigated Area Managed

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $3,517.86

Scenario Cost/Unit: $3,517.86

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	16	$459.36
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	40	$1,944.00
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	10	$1,114.50

Practice: 449 - Irrigation Water Management

Scenario: #6 - Advanced IWM, greater than 30 acres

Scenario Description:

A high intensity irrigation water management system for producers using a checkbook method with advanced methods of determining irrigation water applied, and estimating crop evapotranspiration, monitoring field soil moisture, or monitoring crop temperature stress. Typical methods include flow measurement, daily record keeping, and use of real-time evapotranspiration estimates (such as those provided dedicated weather stations) and/or soil moisture sensors with automated data logging to monitor field soil moisture content and/or crop temperature. For this scenario, soil moisture is determined by automated soil moisture monitoring stations equiped with telemetry data. Irrigation amounts are recorded from a flow meter near the pump. Telemetry data is automatically sent to a computer with irrigation software. Irrigator also receives real time data via mobile phone applications. Some data such as total water applied may be entered into computer software manually.Resource Concerns: Insufficient Water Supply-Inefficient use of irrigation water; Degraded Plant Condition-Undesirable plant productivity and health, and Inefficient Energy Use-Equipment and facilities.Associated Practices: 441-Irrigation System Microirrigation, 442-Irrigation System Sprinkler, 443-Irrigation System Surface and Subsurface, 433-Irrigation Water Measurement, 434-Soil Moisture Measurement, 433- Irrigation Flow Measurement.

Before Situation:

The farmer decides when to irrigate based on general crop or soil appearance or limited soil moisture monitoring. System run times are based on past apparent success.

The typical irrigated field is a 90 acre corn field with sprinkler irrigation.

After Situation:

Irrigations are scheduled based on measured crop water requirements. Records are used to evaluate results of past irrigation events and influence future irrigations. The irrigator keeps records of soil moisture, crop water use, rainfall amounts and irrigation timing and amounts. At the end of the irrigation season all the data has been reviewed and evaluated. Improvements planned for the next season have been determined.

Feature Measure: Irrigated Area Managed

Scenario Unit: Acres

Scenario Typical Size: 90.00

Scenario Total Cost: $3,906.66

Scenario Cost/Unit: $43.41

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	16	$459.36
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	48	$2,332.80
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	10	$1,114.50

Practice: 449 - Irrigation Water Management

Scenario: #7 - Soil Moisture Sensors_YR1

Scenario Description:

This practice includes the installation of soil moisture sensors such as tensiometers, gyp blocks, capacitance sensors etc, that are installed and read to determine point in time soil moisture by depth. Scenario also includes labor associated with using soil moisture meters durign the first year. The installation includes the purchase of soil moisture meters and sensors, installation equipment, and labor to install and read sensors or meter. Typical Scenario involves installation of resistance sensor blocks in a 80 acre field of irrigated cropland. Producer periodically monitors soil moisture sensors during the growing season. Meters used to read sensors may be portable.

Resource Concerns: Insufficient Water - Inefficient use of irrigation water, and Degraded Plant Condition - Undesirable plantproductivity and health, and Inefficient Energy Use - Equipment and facilities.Associated Practices: 449- Irrigation Water Management, 587-Structure for water Control, 328-Conservation Crop Rotation, and 590-Nutrient Management.

Before Situation:

Producer uses feel method to estimate soil moisture for scheduling irrigation.

After Situation:

Producer has installed four sensors at each monitoring site to a depth of four feet with one sensor representing each foot of depth. Producer uses periodic soil moisture measurements to schedule irrigation resulting in improved irrigation water managment and reduced energy use.

Feature Measure: Number of Measuring Sites

Scenario Unit: Each

Scenario Typical Size: 2.00

Scenario Total Cost: $3,614.30

Scenario Cost/Unit: $1,807.15

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	16	$459.36
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	40	$1,944.00
Materials						
Soil Moisture Meter	1455	Soil Moisture Sensor Reader. Equipment only.	Each	$245.42	1	$245.42
Soil Moisture Sensor	1456	Soil moisture resistance sensor with 10 foot cables. Equipment only.	Each	$75.17	8	$601.36
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	2	$364.16

Practice: 449 - Irrigation Water Management

Scenario: #8 - Soil Moisture Sensors with Data Recorder_YR1

Scenario Description:

This practice includes the installation of electrical soil moisture sensors such as capacitance or resistance sensors that are monitored to determine soil moisture. The installation includes the purchase of soil moisture sensors, installation equipment (probe or auger), and a data logger to log continuous soil moisture data that can be downloaded to a personal computer and associated graphing software .Scenario also includes labor associated with using soil moisture sensors and loggers during the first year. Typical Scenario involves installation of resistance sensor blocks in a 120 acre field of sprinkler irrigated cropland. Producer periodically monitors soil moisture sensors during the growing season. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, and Degraded Plant Condition - Undesirable plantproductivity and health, and Inefficient Energy Use - Equipment and facilities. Associated Practices: 449- Irrigation Water Management, 587-Structure for water Control, 328-Conservation Crop Rotation, and 590-Nutrient Management.

Before Situation:

Producer uses feel method to estimate soil moisture for scheduling irrigation in the field.

After Situation:

Producer has installed four sensors at each monitoring site to a depth of four feet with one sensor representing each foot of depth. Producer periodically downloads continuously recorded soil moisture measurements that are used to schedule irrigation more effectively resulting in improved irrigation water managment and reduced energy use.

Feature Measure: Number of Measuring Sites

Scenario Unit: Each

Scenario Typical Size: 2.00

Scenario Total Cost: $4,809.88

Scenario Cost/Unit: $2,404.94

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	16	$459.36
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	40	$1,944.00
Materials						
Data Logger	1453	Data Logger W/Graphic Output for water management. Materials only.	Each	$720.50	2	$1,441.00
Soil Moisture Sensor	1456	Soil moisture resistance sensor with 10 foot cables. Equipment only.	Each	$75.17	8	$601.36
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	2	$364.16

Practice: 449 - Irrigation Water Management

Scenario: #19 - IWM for seasonal high tunnels or small scale specialty crops

Scenario Description:
Implementation of an irrigation water management plan for seasonal high tunnels or specialty crops. The operation consists of either a seasonal high tunnel with microirrigation or an outdoor specialty crop field with a surface drip irrigation system. Producers typically use a checkbook method (crop grown, soil moisture conditions prior to irrigation, dates of irrigation start and stop, depths of irrigation applied, duration of irrigations, and amount of rainfall). Resource Concerns: Insufficient Water Supply-Inefficient use of irrigation water; Degraded Plant Condition-Undesirable plant productivity and health, and Inefficient Energy Use-Equipment and facilities.

Before Situation:
The farmer decides when to irrigate based on general crop or soil appearance or limited soil moisture monitoring. System run times are based on past apparent success.

The typical irrigated field is a seasonal high tunnel with microirrigation or a 5 acre specialty crop field with a surface drip irrigation.

After Situation:
Irrigations are scheduled based on measured crop water requirements. Records are used to evaluate results of past irrigation events and to influence future irrigations. The irrigator keeps records of soil moisture, crop water use, rainfall amounts if outdoor fields are part of the operation, and irrigation timing and amounts. At the end of the irrigation season all of the data has been reviewed and evaluated. Improvements planned for the next season have been determined. Associated Practices:441-Irrigation System Microirrigation, 442-Irrigation System Sprinkler, 443-Irrigation System Surface and Subsurface.

Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $344.52

Scenario Cost/Unit: $344.52

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	12	$344.52

Practice: 449 - Irrigation Water Management

Scenario: #26 - Soil Moisture Sensors with Data Recorder with Telemetry_YR1

Scenario Description:

This practice includes the installation of electrical soil moisture sensors such as capacitance or resistance sensors that are monitored to determine soil moisture. The installation includes the purchase of soil moisture sensors, installation equipment (probe or auger), and a data logger with telemetry to log and transmit continuous soil moisture data that can be accessed with a personal computer and associated graphing software .Scenario also includes labor associated with using soil moisture sensors and loggers during the first year. Typical Scenario involves installation of resistance sensor blocks in a 120 acre field of sprinkler irrigated cropland. Producer periodically monitors soil moisture sensors during the growing season. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, and Degraded Plant Condition - Undesirable plant productivity and health, and Inefficient Energy Use - Equipment and facilities. Associated Practices: 449- Irrigation Water Management, 587-Structure for water Control, 328- Conservation Crop Rotation, and 590-Nutrient Management.

Before Situation:

Producer uses feel method to estimate soil moisture for scheduling irrigation in the field.

After Situation:

Producer has installed four sensors at each monitoring site to a depth of four feet with one sensor representing each foot of depth. Producer monitors continuously recorded soil moisture measurements that are used to schedule irrigation more effectively resulting in improved irrigation water management and reduced energy use.

Feature Measure: Number of Measuring Sites

Scenario Unit: Each

Scenario Typical Size: 2.00

Scenario Total Cost: $6,695.82

Scenario Cost/Unit: $3,347.91

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	16	$459.36
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	40	$1,944.00
Materials						
Data Logger with Telemetry System	1454	Data Logger W/Graphic Output for water management and telemetry - data communication device with power supply in a weather proof enclosure. Equipment only.	Each	$1,663.47	2	$3,326.94
Soil Moisture Sensor	1456	Soil moisture resistance sensor with 10 foot cables. Equipment only.	Each	$75.17	8	$601.36
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	2	$364.16

Practice: 449 - Irrigation Water Management

Scenario: #73 - Flow Meter with Electronic Index

Scenario Description:

Installed water flow meter onto a closed pressure conduit with an electrical, cumulative volume and rate index. Meters can be any flow measurement device as described in Chapter 14 of the United States Bureau of Reclamation Water Measurement Manual, (i.e. meters: turbine, propeller, acoustic, magnetic, venturi, orifice, etc.) with or without straightening vanes. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, and Degraded Plant Condition - Undesirable plant productivity and health, and Inefficient Energy Use - Equipment and facilities. Flow meter is purchased and installed the first year of irrigation water management. Associated Practices: 533- Pumping Plant, 441-Irrigation System, Microirrigation, 443-Irrigation System Surface and Subsurface, 442-Irrigation System, Sprinkler, 328-Conservation Crop Rotation, 634-Waste Transfer, and 590-Nutrient Management.

Before Situation:

Producer estimates seasonal and individual irrigation application flow rate and volumes based on energy costs, system operating pressure, or other means.

After Situation:

Producer is able to access instantaneous rate and cumulative flow volume data at the meter location. The information gained will enable the irrigator to improve irrigation water management, recognize system performance issues before they become critical, and reduce energy use.

Feature Measure: Nominal Diameter of Meter

Scenario Unit: Inch

Scenario Typical Size: 10.00

Scenario Total Cost: $3,804.12

Scenario Cost/Unit: $380.41

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	4	$175.48
Materials						
Flow Meter, with Electronic Index	1452	10 inch Turbine Irrigation flow meter, with Electronic Index, Rate and Volume, permanently installed. Materials only.	Each	$3,628.64	1	$3,628.64

Practice: 449 - Irrigation Water Management

Scenario: #75 - Flow Meter with Electronic Index & Telemetry

Scenario Description:

Installed water flow meter onto a closed pressure conduit with an electrical, cumulative volume and rate index and data telemetry transmission system. Meters can be any flow measurement device as described in Chapter 14 of the United States Bureau of Reclamation Water Measurement Manual, (i.e. meters: turbine, propeller, acoustic, magnetic, venturi, orifice, etc.) with or without straightening vanes. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, and Degraded Plant Condition - Undesirable plant productivity and health, and Inefficient Energy Use - Equipment and facilities. Flow meter is purchased and installed the first year of irrigation water management. Associated Practices: 533- Pumping Plant, 441-Irrigation System, Microirrigation, 443-Irrigation System Surface and Subsurface, 442-Irrigation System, Sprinkler, 328-Conservation Crop Rotation, 634-Waste Transfer, and 590-Nutrient Management.

Before Situation:

Producer estimates seasonal and individual irrigation application flow rate and volumes based on energy costs, system operating pressure, or other means.

After Situation:

Producer is able to access instantaneous rate and cumulative flow volume data from a personal computer or mobile device at any time. The information gained will enable the irrigator to improve irrigation water management, recognize system performance issues before they become critical, and reduce energy use.

Feature Measure: Nominal Diameter of Meter

Scenario Unit: Inch

Scenario Typical Size: 10.00

Scenario Total Cost: $5,383.71

Scenario Cost/Unit: $538.37

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	4	$175.48
Materials						
Flow Meter, with electronic Index and telemetry	1451	10 inch Magnetic Irrigation Flow Meter, with electronic index and equipped for telemetry, permanently installed. Includes material and shipping only.	Each	$5,208.23	1	$5,208.23

Practice: 449 - Irrigation Water Management

Scenario: #76 - Flow Meter with Mechanical Index

Scenario Description:

Installed water flow meter on a closed pressure conduit with mechanical, cumulative volume and rate index. Meters can be any flow measurement device as described in Chapter 14 of the United States Bureau of Reclamation Water Measurement Manual, (i.e. meters: turbine, propeller, acoustic, magnetic, venturi, orifice, etc.) with or without straightening vanes. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, and Degraded Plant Condition - Undesirable plant productivity and health, and Inefficient Energy Use - Equipment and facilities. Flow meter is purchased and installed the first year of irrigation water management. Associated Practices: 533- Pumping Plant, 441-Irrigation System, Microirrigation, 443-Irrigation System Surface and Subsurface, 442-Irrigation System, Sprinkler, 328-Conservation Crop Rotation, 634-Waste Transfer, and 590-Nutrient Management.

Before Situation:

Producer estimates seasonal and individual irrigation application flow rate and volumes based on energy costs, system operating pressure, or other means.

After Situation:

Producer is able to access instantaneous rate and cumulative flow volume data at the meter location. The information gained will enable the irrigator to improve irrigation water management, recognize system performance issues before they become critical, and reduce energy use.

Feature Measure: Nominal Diameter of Meter

Scenario Unit: Inch

Scenario Typical Size: 10.00

Scenario Total Cost: $1,917.56

Scenario Cost/Unit: $191.76

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	4	$175.48
Materials						
Flow Meter, with mechanical Index	1450	10 inch, Turbine Type Flow Meter with Mechanical Index, permanently installed. Includes materials and shipping only.	Each	$1,742.08	1	$1,742.08

Practice: 457 - Mine Shaft and Adit Closing

Scenario: #1 - Horizontal Shaft, Bat Grating

Scenario Description:
This scenario addresses closure of horizontal shaft underground mine openings by installing barriers, grating or fencing in order to reduce safety hazards for humans and large animals; maintain or improve access and/or habitat for wildlife, specifically bats and other small wildlife; protect cultural resources which are known to be present in the shaft. For this scenario, problems with subsidence, emission of hazardous gases, and/or contamination of surface and ground water resources are not present. Critical Area Planting (342) & Fence (382) may be associated practices.

Before Situation:
A horizontal shaft that presents a threat to safety for humans and large animals. The shaft is being utilized by bats and other wildlife, or there are known cultural resources present in the shaft that need to be protected.

After Situation:
Bat grating is used to close the shaft to prevent access by humans and other large animals, but not impede wildlife usage.

Feature Measure: SF of opening

Scenario Unit: Square Feet

Scenario Typical Size: 75.00

Scenario Total Cost: $16,408.84

Scenario Cost/Unit: $218.78

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	6	$3,402.48
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	60	$151.20
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	60	$375.00
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	16	$2,088.16
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	20	$507.20
Portable Welder	1407	Portable field welder. Equipment only. Labor not included.	Hours	$19.45	4	$77.80
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	6	$263.22
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	32	$918.72
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	16	$642.08
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	16	$777.60
Materials						
Bat Gate	1129	Bat Gate Assembly, Includes materials, equipment and labor.	Square Feet	$72.37	75	$5,427.75
Epoxy anchor	1599	Galvanized bolts anchored into concrete or stone using epoxy adhesive. Includes materials and labor to drill and install.	Each	$20.26	50	$1,013.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 460 - Land Clearing

Scenario: #45 - Non-Heavy Equipment

Scenario Description:

Site preparation of a field with a labor crew, chainsaws, chippers or similar equipment removing trees and shrubs to achieve a conservation objective. Dispose of all brush and trees by wood chipping and or land distribution, burial at an approved location or burning. If burning is used, adhere to all state and local regulations and implement appropriate smoke management to protect public health and safety. Typical scenario is approximately 1 acre of trees and shrubs to be cleared. Remove and dispose of brush and trees in order to apply conservation practices or facilitate the planned land use. Brush and tree removal will address the resource concerns of the prevention or hindrance to the installation of conservation practices or present a hazard to their use and enjoyment. Associated practices: Critical Area Planting (342), Stormwater Runoff Control (570)

Before Situation:

Forested field of approximately 1 acre, with moderate density evenly spaced tree canopy, where existing vegetation interferes with planned conservation objectives.

After Situation:

Labor crew uses chainsaws, chippers, or similar equipment to clear trees and prepare the field for a conservation objective, includes on-site disposal as necessary. Dispose of all brush and trees from the obstruction removal so that it does not impede subsequent work or cause onsite or offsite damage. Revegetate or otherwise protect from erosion disturbed areas as soon as possible. Refer to NRCS Conservation Practice Standard 342, Critical Area Planting for seedbed preparation, seeding, fertilizing, and mulching requirements. The practice is to improve site conditions in order to apply conservation practices or facilitate better use of the landscape. If erosion control measures are required refer to NRCS Conservation Practice Standard 570, Stormwater Runoff Control.

Feature Measure: Area Cleared

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $1,498.72

Scenario Cost/Unit: $1,498.72

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	18	$113.40
Brush Chipper, 6 in. capacity	938	Brush Chipper, 6 inch capacity, typically 35 HP. Includes chipper and power unit. Labor not included.	Hours	$34.98	6	$209.88
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	12	$304.32
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	24	$689.04
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08

Practice: 460 - Land Clearing

Scenario: #46 - Heavy Equipment

Scenario Description:
Site preparation of a field with dozer or equivalent heavy equipment to achieve a conservation objective. Dispose of all brush and trees by wood chipping and or land distribution, burial at an approved location or burning. If burning is used, adhere to all state and local regulations and implement appropriate smoke management to protect public health and safety. Typical scenario is approximately 10 acres of trees and shrubs to be cleared. Remove and dispose of brush and trees in order to apply conservation practices or facilitate the planned land use. Brush and tree removal will address the resource concerns of the prevention or hindrance to the installation of conservation practices or present a hazard to their use and enjoyment. Associated practices: Critical Area Planting (342), Stormwater Runoff Control (570)

Before Situation:
Forested field of approximately 10 acres, with moderate density evenly spaced tree canopy, where existing vegetation interferes with planned conservation objectives.

After Situation:
Crew uses 200 HP dozer to clear trees and prepare field for conservation objective and a chain saw and brush chipper to break down woody debris for disposal. Includes on-site debris disposal as necessary. Dispose of all brush and trees from the obstruction removal so that it does not impede subsequent work or cause onsite or offsite damage. Revegetate or otherwise protect from erosion disturbed areas as soon as possible. Refer to NRCS Conservation Practice Standard 342, Critical Area Planting for seedbed preparation, seeding, fertilizing, and mulching requirements. The practice is to improve site conditions in order to apply conservation practices or facilitate better use of the landscape. If erosion control measures are required refer to NRCS Conservation Practice Standard 570, Stormwater Runoff Control.

Feature Measure: Area Cleared

Scenario Unit: Acres

Scenario Typical Size: 10.00

Scenario Total Cost: $22,072.77

Scenario Cost/Unit: $2,207.28

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 200 HP	928	Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included.	Hours	$182.87	50	$9,143.50
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	25	$157.50
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	20	$507.20
Brush Chipper, 15 in. capacity	1868	Brush Chipper, 15 inch capacity, typically 165 HP. Includes chipper and power unit. Does not include labor.	Hours	$75.99	75	$5,699.25
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	100	$2,871.00
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	50	$2,006.50
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 462 - Precision Land Forming and Smoothing

Scenario: #26 - Minor Shaping

Scenario Description:
The land surface is shaped or leveled to a specific elevation and grade for various land uses. Cuts and fills are small. The resource concerns are EXCESS / INSUFFICIENT WATER -(Ponding, Flooding) and SOIL EROSION -(Sheet, Rill)

Before Situation:
The field has minor topographic issues or problems with surface drainage or erosion which can be corrected without land leveling or land smoothing. Site conditions require attention to elevation and grade. Typical situation is a 5 acre field. Material to be moved and or placed typically around 100 cubic yards per acre.

After Situation:
Land has been shaped to the required elevations and grades. Resource concerns have been treated. Associated practices, like plantings or drainage water management practices, would be contracted seperately as needed.

Feature Measure: Acres of land treated

Scenario Unit: Acres

Scenario Typical Size: 5.00

Scenario Total Cost: $3,772.29

Scenario Cost/Unit: $754.46

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$100.26	6	$601.56
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$56.88	6	$341.28
Scraper, pull, 7 CY	1206	Pull type earthmoving scraper with 7 CY capacity. Does not include pulling equipment or labor. Add Tractor or Dozer, 160 HP typically required for single scraper.	Hours	$18.77	6	$112.62
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	6	$182.16
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	6	$240.78
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	3	$2,293.89

Practice: 462 - Precision Land Forming and Smoothing

Scenario: #27 - Site Stabilization

Scenario Description:
The site contains a gully or other site specific topographic problem. Site conditions require attention to elevation and grade. Resource concerns are EXCESS / INSUFFICIENT WATER -(Ponding, Flooding) and SOIL EROSION -(Sheet, Rill)

Before Situation:
The site, commonly a crop field or CAFO, has localized gully or topographic issues causing drainage or erosion problems. Typical situation is a gully 10 feet wide and 5 feet deep.

After Situation:
Land has been shaped to the required elevations and grades. Resource concerns have been treated. Associated practices, like plantings or drainage water management practices, would be contracted seperately as needed.

Feature Measure: Cubic yards of material placed

Scenario Unit: Cubic Yards

Scenario Typical Size: 6,000.00

Scenario Total Cost: $15,884.63

Scenario Cost/Unit: $2.65

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	6000	$15,120.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 462 - Precision Land Forming and Smoothing

Scenario: #43 - Minor Shaping - Field Scale

Scenario Description:
Removing irregularities on the land surface of cropland by use of heavy equipment.

Before Situation:
Field damaged by flooding, past agricultural practices, or other topographic issues causing drainage or field workability issues. Typically less than 100 cy/acre material moved.

After Situation:
Land level, backhoe, bulldozer or other heavy equipment used to correct irregularities and address drainage or workability issues.

Feature Measure: Acres of land treated

Scenario Unit: Acres

Scenario Typical Size: 40.00

Scenario Total Cost: $3,979.00

Scenario Cost/Unit: $99.48

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$100.26	25	$2,506.50
Scraper, pull, 7 CY	1206	Pull type earthmoving scraper with 7 CY capacity. Does not include pulling equipment or labor. Add Tractor or Dozer, 160 HP typically required for single scraper.	Hours	$18.77	25	$469.25
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	25	$1,003.25

Practice: 464 - Irrigation Land Leveling

Scenario: #21 - Small Scale Irrigation Land Leveling

Scenario Description:
This is scenario will level a typical 10 acres of irrigated crop land surface to enhance uniform flow of surface water to improve irrigation efficiency using dirtpans/carry-all/pan-scraper equipment. The typical volume of earth moved is 100 to 500 cubic yards per acre. Resource Concern: Excess/Insufficient - Inefficient Use of Irrigation Water Associated Conservation Practices: 433 - Irrigation System, Surface and Subsurface; 607 - Surface Drain, Field Ditch; 388 - Irrigation Field Ditch; 449 - Irrigation Water Management; or 587 - Structure for Water Control.

Before Situation:
Irregular field surface reduces uniformity of surface application and thus irrigation efficiency by localized ponding and/or excess runoff/run-on.

After Situation:
Cropland will be reshaped to provide uniform distribution of irrigation water in order to promote irrigation efficiencies.

Feature Measure: Acres of Area

Scenario Unit: Acres

Scenario Typical Size: 10.00

Scenario Total Cost: $11,926.38

Scenario Cost/Unit: $1,192.64

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	4000	$10,080.00
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	2	$1,846.38

Practice: 464 - Irrigation Land Leveling

Scenario: #34 - Irrigation Land Leveling

Scenario Description:
This is scenario will level a typical 80 acres of irrigated crop land surface to enhance uniform flow of surface water to improve irrigation efficiency using dirtpans/carry-all/pan-scraper equipment. The typical volume of earth moved is 100 to 500 cubic yards per acre. Resource Concern: Excess/Insufficient - Inefficient Use of Irrigation Water Associated Conservation Practices: 433 - Irrigation System, Surface and Subsurface; 607 - Surface Drain, Field Ditch; 388 - Irrigation Field Ditch; 449 - Irrigation Water Management; or 587 - Structure for Water Control.

Before Situation:
Irregular field surface reduces uniformity of surface application and thus irrigation efficiency by localized ponding and/or excess runoff/runon.

After Situation:
Cropland will be reshaped to provide uniform distribution of irrigation water in order to promote irrigation efficiencies.

Feature Measure: Volume of Earth Moved

Scenario Unit: Cubic Yards

Scenario Typical Size: 28,000.00

Scenario Total Cost: $71,167.88

Scenario Cost/Unit: $2.54

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	28000	$70,560.00
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	2	$607.88

Practice: 468 - Lined Waterway or Outlet

Scenario: #1 - Turf Reinforced Matting (LSR)

Scenario Description:

Install 300 ' long by 15' wide (TW) by 1.5' deep trapezoidal or parabolic shaped waterway lined with Turf Reinforced Matting (TRM). 1/2 the channel is excavated. Excess excavation is spoiled in the immediate area. TRM is installed over 100% of the width of the waterway to prevent scour and aid in waterway establishment. Cost include excavation, spoiling of excess material, furnishing and installing TRM, and establishment of vegetation. Lined waterway width is measured from top of bank to top of bank.

Before Situation:

Excessive sedimentation and soil erosion as a result of ephemeral or classic gully erosion. Velocities are generally too high or saturated soil conditions make it difficult to establish a grassed waterway.

After Situation:

TRM lined waterway is 300 ' long by 15' wide (TW) by 1.5' deep. The practice is installed using a hydraulic excavator. TRM is installed by laborers. Associated practices are Grassed Waterway (412), Mulching (484), Obstruction Removal (500), Subsurface Drain (606), Underground Outlet (620), Stormwater Runoff Control (570), and Structure for Water Control (587).

Feature Measure: Topwidth x Length of Waterway

Scenario Unit: Square Feet

Scenario Typical Size: 4,500.00

Scenario Total Cost: $6,222.88

Scenario Cost/Unit: $1.38

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	90	$226.80
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	0.2	$2.98
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.61	0.1	$0.76
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	0.1	$2.23
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$10.18	0.1	$1.02
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	4	$114.84
Materials						
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	6	$4.08
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.81	6	$4.86
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	6	$4.08
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$26.18	0.2	$5.24
Turf reinforcement mat	1212	Synthetic turf reinforcement mat with staple anchoring. Includes materials, equipment and labor.	Square Yard	$9.50	535	$5,082.50
Introduced Perennial Grasses, Legumes and/or Forbs, High Density	2749	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping.	Acres	$88.70	0.1	$8.87
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 468 - Lined Waterway or Outlet

Scenario: #2 - Rock Lined - D50 <= 6 inch

Scenario Description:

Install 300 ' long by 15' wide by 1.5' deep trapezoidal or parabolic shaped waterway lined with riprap (D50 = 6'). 1/2 the channel is excavated, before excavation for riprap. Excess excavation is spoiled in the immediate area. Riprap is installed over 100% of the width of the waterway to prevent scour or as a rock center for grassed waterways with prolonged flows. Cost include excavation, spoiling of excess material, geotextile underlayment and installing 12' of Rock Riprap. Lined waterway width is measured from top of rock bank to top of rock bank in a plan view measurement.

Before Situation:

Excessive sedimentation and soil erosion as a result of ephemeral or classic gully erosion. Velocities are generally too high or saturated soil conditions make it difficult to establish a grassed waterway.

After Situation:

Rock lined waterway is 300 ' long by 15' wide by 1.5' deep. Waterway is excavated and rock is placed using a hydraulic excavator. Geotextile underlayment is installed by laborers. Associated practices are Critical Area Planting (342), Grade Stabilization Structure (410), Grassed Waterway (412), Mulching (484), Obstruction Removal (500), Stormwater Runoff Control (570), Structure for Water Control (587), Subsurface Drain (606), and Underground Outlet (620).

Feature Measure: Topwidth x Length of Rock

Scenario Unit: Square Feet

Scenario Typical Size: 4,500.00

Scenario Total Cost: $29,568.43

Scenario Cost/Unit: $6.57

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	295	$743.40
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement.	Cubic Yards	$136.88	205	$28,060.40
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 468 - Lined Waterway or Outlet

Scenario: #3 - Rock Lined - D50 > 6 inch

Scenario Description:

Install 300 ' long by 15' wide by 1.5' deep trapezoidal or parabolic shaped waterway lined with riprap (D50 = 9'). 1/2 the channel is excavated, before excavation for riprap. Excess excavation is spoiled in the immediate area. Riprap is installed over 100% of the width of the waterway to prevent scour. Cost include excavation, spoiling of excess material, geotextile underlayment and installing 18' thick Rock Riprap. Lined waterway width is measured from top of bank to top of bank.

Before Situation:

Excessive sedimentation and soil erosion as a result of ephemeral or classic gully erosion. Velocities are generally too high or saturated soil conditions make it difficult to establish a grassed waterway.

After Situation:

Rock lined waterway is 300 ' long by 15' wide (TW) by 1.5' deep. Waterway is excavated and rock is placed using a hydraulic excavator. Geotextile underlayment is installed by laborers. Associated practices are Critical Area Planting (342), Grade Stabilization Structure (410), Grassed Waterway (412), Mulching (484), Obstruction Removal (500), Stormwater Runoff Control (570), Structure for Water Control (587), Subsurface Drain (606), and Underground Outlet (620).

Feature Measure: Topwidth x Length of Waterway

Scenario Unit: Square Feet

Scenario Typical Size: 4,500.00

Scenario Total Cost: $46,912.91

Scenario Cost/Unit: $10.43

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	551	$1,388.52
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement.	Cubic Yards	$136.88	327	$44,759.76
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 468 - Lined Waterway or Outlet

Scenario: #4 - Concrete (LSR)

Scenario Description:

Install 300 ' long by 15' wide by 1.5' deep trapezoidal or parabolic shaped waterway lined with concrete. 1/2 the channel is excavated, before excavation for concrete and subgrade material. Excess excavation is spoiled in the immediate area. Concrete is installed over 100% of the width of the waterway to prevent scour. Cost include excavation, spoiling of excess material, 6' of clean sand or gravel subgrade, and 5' reinforced concrete slab. Lined waterway width is measured from top of bank to top of bank.

Before Situation:

Excessive sedimentation and soil erosion as a result of ephemeral or classic gully erosion. Velocities are generally too high or saturated soil conditions make it difficult to establish a grassed waterway. Usually installed in locations where rock or other lining materials are not readily available.

After Situation:

Concrete lined waterway is 300 ' long by 15' wide by 1.5' deep. Waterway is excavated using a hydraulic excavator. Concrete slab is placed on 6' of clean sand or #57 stone. Concrete is placed, graded and screeded by laborers. Associated practices are Critical Area Planting (342), Grade Stabilization Structure (410), Grassed Waterway (412), Mulching (484), Obstruction Removal (500), Stormwater Runoff Control (570), Structure for Water Control (587), Subsurface Drain (606), and Underground Outlet (620).

Feature Measure: Topwidth x Length of Waterway

Scenario Unit: Square Feet

Scenario Typical Size: 4,500.00

Scenario Total Cost: $44,909.83

Scenario Cost/Unit: $9.98

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	80	$40,100.00
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	280	$705.60
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	110	$3,339.60
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 468 - Lined Waterway or Outlet

Scenario: #41 - Rock Lined, 12 inch

Scenario Description:
Install 300 ' long by 15' wide by 1.5' deep trapezoidal or parabolic shaped waterway lined with riprap (D100 = 9', Velocity ~ 8 ft/sec). 1/2 the channel is excavated, before excavation for riprap. Excess excavation is spoiled in the immediate area. Riprap is installed over 100% of the width of the waterway to prevent scour. Cost include excavation, spoiling of excess material, geotextile underlayment and installing 9' Rock Riprap. Lined waterway width is measured from top of bank to top of bank.

Before Situation:
Excessive sedimentation and soil erosion as a result of ephemeral or classic gully erosion. Velocities are generally too high or saturated soil conditions make it difficult to establish a grassed waterway.

After Situation:
Rock lined waterway is 300 ' long by 15' wide by 1.5' deep. Waterway is excavated and rock is placed using a hydraulic excavator. Geotextile underlayment is installed by laborers. Associated practices are Subsurface Drain (606), Underground Outlet (620), Structure for Water Control (587), and Critical Area Seeding (342).

Feature Measure: Square Foot of Waterway

Scenario Unit: Square Feet

Scenario Typical Size: 4,500.00

Scenario Total Cost: $29,723.05

Scenario Cost/Unit: $6.61

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	295	$743.40
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	2	$57.42
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	2	$97.20
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement.	Cubic Yards	$136.88	205	$28,060.40
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 468 - Lined Waterway or Outlet

Scenario: #42 - Concrete Block

Scenario Description:

Install 36' long (including inlet and outlet aprons) by 15' wide by 1.5' deep trapezoidal shaped waterway or chute lined with concrete blocks. 1/2 the channel is excavated. Excess excavation is spoiled in the immediate area. 8'x8'x16' standard concrete blocks are installed over 100% of the width of the waterway/chute to prevent scour. Cost include excavation, spoiling of excess material, 3' stone subgrade, geotextile and furnishing and installing standard concrete blocks. Lined waterway width is measured from top of bank to top of bank.

Before Situation:

Excessive sedimentation and soil erosion as a result of ephemeral or classic gully erosion. Velocities are generally too high or saturated soil conditions make it difficult to establish a grassed waterway. Usually installed in locations where rock or other lining materials are not readily available.

After Situation:

Conccrete block lined waterway or chute is 36 ' long by 15' wide by 1.5' deep. Chute is installed on a 3 to 1 slope. The practice is installed using a hydraulic excavator. Geotextile and concrete blocks are installed by laborers. Associated practices are Subsurface Drain (606), Underground Outlet (620), Structure for Water Control (587), and Critical Area Seeding (342).

Feature Measure: Square Foot of Waterway

Scenario Unit: Square Feet

Scenario Typical Size: 540.00

Scenario Total Cost: $3,741.82

Scenario Cost/Unit: $6.93

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.11	65	$72.15
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	32	$80.64
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	24	$689.04
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	2	$97.20
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	6	$182.16
Block, concrete	253	Concrete block, hollow, normal weight, 3500 psi. Includes both full and partial sizes. Material only	Each	$2.90	640	$1,856.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 468 - Lined Waterway or Outlet

Scenario: #50 - Turf Reinforced Matting

Scenario Description:
Install 300 ' long by 15' wide by 1.5' deep trapezoidal or parabolic shaped waterway lined with Turf Reinforced Matting (TRM). 1/2 the channel is excavated. Excess excavation is spoiled in the immediate area. TRM is installed over 100% of the width of the waterway to prevent scour and aid in waterway establishment. Cost include excavation, spoiling of excess material, and furnishing and installing TRM. Lined waterway width is measured from top of bank to top of bank.

Before Situation:
Excessive sedimentation and soil erosion as a result of ephemeral or classic gully erosion. Velocities are generally too high or saturated soil conditions make it difficult to establish a grassed waterway.

After Situation:
TRM lined waterway is 300 ' long by 15' wide by 1.5' deep. The practice is installed using a hydraulic excavator. TRM is installed by laborers. Associated practices are Subsurface Drain (606), Underground Outlet (620), Structure for Water Control (587), and Critical Area Seeding (342).

Feature Measure: Square Foot of Waterway

Scenario Unit: Square Feet

Scenario Typical Size: 4,500.00

Scenario Total Cost: $6,171.13

Scenario Cost/Unit: $1.37

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	90	$226.80
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	2	$97.20
Materials						
Turf reinforcement mat	1212	Synthetic turf reinforcement mat with staple anchoring. Includes materials, equipment and labor.	Square Yard	$9.50	535	$5,082.50
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 468 - Lined Waterway or Outlet

Scenario: #51 - Concrete

Scenario Description:

Install 300 ' long by 15' wide by 1.5' deep trapezoidal or parabolic shaped waterway lined with concrete. 1/2 the channel is excavated, before excavation for concrete and subgrade material. Excess excavation is spoiled in the immediate area. Concrete is installed over 100% of the width of the waterway to prevent scour. Cost include excavation, spoiling of excess material, 6' of clean sand or gravel subgrade, and 5' reinforced concrete slab. Lined waterway width is measured from top of bank to top of bank.

Before Situation:

Excessive sedimentation and soil erosion as a result of ephemeral or classic gully erosion. Velocities are generally too high or saturated soil conditions make it difficult to establish a grassed waterway. Usually installed in locations where rock or other lining materials are not readily available.

After Situation:

Concrete lined waterway is 300 ' long by 15' wide by 1.5' deep. Waterway is excavated using a hydraulic excavator. Concrete slab is placed on 6' of clean sand or #57 stone. Concrete is placed, graded and screeded by laborers. Associated practices are Subsurface Drain (606), Underground Outlet (620), Structure for Water Control (587), and Critical Area Seeding (342).

Feature Measure: Square Foot of Waterway

Scenario Unit: Square Feet

Scenario Typical Size: 4,500.00

Scenario Total Cost: $45,064.45

Scenario Cost/Unit: $10.01

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	80	$40,100.00
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	280	$705.60
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	2	$57.42
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	2	$97.20
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	110	$3,339.60
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 472 - Access Control

Scenario: #2 - Protection of a designated sensitive area threatened by environmental stressors

Scenario Description:
Protection of a designated sensitive area that is not considered cropland, threated by environmental stressors and contains sensitive features such as threatened or endangered species. Control will be by temporary electric fencing. Any need for permanent fencing will be planned and installed using the Fence practice (382). Clearing of brush and trees is not necessary.

Before Situation:
Designated sensitive areas not in a cropland that are threatened by environmental stressors. The importance of the sensitive areas can include (but are not limited to): wildlife habitat, plant species composition, newly established trees and/or plants, stream bank stability, and/or water quality.

After Situation:
Sensitive areas are protected from the environmental stressors.

Feature Measure: Acres

Scenario Unit: Acres

Scenario Typical Size: 10.00

Scenario Total Cost: $649.05

Scenario Cost/Unit: $64.91

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	4	$101.44
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	4	$114.84
Materials						
Post, Wood, CCA treated, 4 in x 8 ft	10	Wood Post, Line 4 inch X 8 foot, CCA Treated. Includes materials and shipping only.	Each	$13.92	4	$55.68
Property/Safety Signs	293	Plastic fence safety or property sign, printed on both sides with 6 pre-drilled holes for hanging or nailing. 7.5 x 4.75 inch. Includes materials and shipping only.	Each	$2.09	35	$73.15
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 472 - Access Control

Scenario: #35 - Trail/Road Access Control with hand tools

Scenario Description:
Restricting access to the use of forest/farm/garden roads and trails by the use of a gate and limited fencing. Resource concerns include undesirable plant productivity and health, concentrated flow erosion, soil compaction, and excessive sediment in surface waters.

Before Situation:
Roads or trails are damaged or misused, illegal activities occur, and/or forest/farm/garden resources are at risk. Extensive amount of fencing (other than that needed to restrict access at the site of ingress) is not included in this scenario, but instead will be planned and installed with the Fence practice (382).

After Situation:
Road/trails are protected, illegal activities are stopped and/or forest/farm/garden resources are secure.

Feature Measure: Number

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $794.11

Scenario Cost/Unit: $794.11

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	4	$101.44
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$12.51	2	$25.02
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Materials						
Post, Wood, CCA treated, 3-4 in. x 7 ft.	9	Wood Post, Line 3-4 inch dia. X 7 ft., CCA Treated. Includes materials and shipping only.	Each	$11.38	4	$45.52
Post, Wood, CCA treated, 6 in. x 8 ft.	12	Wood Post, End 6 inch dia. X 8 ft., CCA Treated. Includes materials and shipping only.	Each	$25.26	4	$101.04
Gate, Pipe, 12 ft.	1057	6 rail tube gate, 16 gauge. Includes materials and shipping only.	Each	$239.41	1	$239.41
Concrete mix, bag	1226	Pre-mixed dry concrete mix in 60 pound bag. Materials only.	Each	$5.20	10	$52.00

Practice: 472 - Access Control

Scenario: #37 - Woody Residue Perimeter Based Protection for Tree-Shrub Regeneration Area

Scenario Description:

Regenerate a forest stand using natural or artificial regeneration and necessary site preparation. When implemented with the guidance of a professional forester, such silvicultural activities result in well stocked stands representative of the natural community. Piling of woody residue from silvicultural or timber sale operations is used to provide temporary protection for regenerating trees, to improve the likelihood of successful regeneration and achieve landowner objectives for future forest stand composition. Seedlings are protected by 8' high X 20??? wide wall of woody residue, designed with larger material at the base and smaller material at the top. Material supplied from within 100??? of the wall location for maximum efficiency. Woody residue barrier is effective until seedlings no longer require protection and barrier then decomposes over time. Resource concerns include: Plant Structure and Composition; Plant Productivity and Health; Animal Terrestrial Habitat for Wildlife and Invertebrates.

Before Situation:

Forest stands lack the desired species composition and/or structure, and/or have been impacted by environmental stressors and are unhealthy. Wildlife habitat is inadequate. Forest conditions do not meet landowner objectives. Environmental conditions are limiting to forest regeneration and establishment, and temporary protection will be needed.

After Situation:

Forest regeneration has been accomplished on 5 acres of forest land. Trees are successfully established and the forest exhibits the planned mix of diverse native tree species. The future forest will improve degraded plant condition, reduce soil erosion, establish wildlife habitat, and sequester carbon. Perimeter of the five acre area was calculated as a 330' X 660' rectangle.

Feature Measure: Perimeter of area

Scenario Unit: Feet

Scenario Typical Size: 1,980.00

Scenario Total Cost: $3,227.91

Scenario Cost/Unit: $1.63

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$100.26	12	$1,203.12
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	2	$50.72
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	4	$175.48
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	12	$481.56
Materials						
Post, Wood, CCA treated, 6 in. x 12-14 ft.	13	Wood Post, Line/End 6 inch dia. X 12-14 ft., CCA Treated. Includes materials and shipping only.	Each	$38.98	2	$77.96
Property/Safety Signs	293	Plastic fence safety or property sign, printed on both sides with 6 pre-drilled holes for hanging or nailing. 7.5 x 4.75 inch. Includes materials and shipping only.	Each	$2.09	19	$39.71
Gate, Game, 8 ft. High X 4 ft. Wide	1082	4 Foot wide game gate (8 feet tall). Includes materials and shipping only.	Each	$276.17	1	$276.17
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 484 - Mulching

Scenario: #1 - Natural Material, Full Coverage

Scenario Description:
Application of straw mulch or other state approved natural material to reduce erosion and facilitate the establishment of vegetative cover. Mulch provides full coverage and is typically used with critical area planting. Assumes 125 bales/acre (3 bales/1000 sq ft)

Before Situation:
Typical scenario ranges from a 0.1 to 1.0 acre disturbed site around a newly constructed structural practice. The potential for soil erosion is high and mulch is needed to stabilize the soil and facilitate the establishment of vegetative cover.

After Situation:
Straw mulch has been applied to areas needing mulch. Erosion and sedimentation is reduced, water and soil quality is protected, and vegetative cover is established.

Feature Measure: Area Covered by Mulch

Scenario Unit: Square Feet

Scenario Typical Size: 43,560.00

Scenario Total Cost: $1,493.16

Scenario Cost/Unit: $0.03

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	1	$25.36
Mulcher, straw blower	1305	Straw bale mulcher/blower to mechanically spread small or large straw bales. Labor not included.	Hours	$83.82	10	$838.20
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	10	$287.10
Materials						
Straw	1237	Small grain straw (non organic and certified organic). Includes materials only.	Ton	$137.00	2.5	$342.50

Practice: 484 - Mulching

Scenario: #3 - Erosion Control Blanket

Scenario Description:
Installation of erosion control blanket on critical areas with steep slopes, grassed waterways or diversions.. Blanket is typically made of coconut coir, wood fiber, straw and is typically covered on both sides with biodegradable polypropylene netting. Used to help control erosion and establish vegetative cover. Typical Size is 8000 sq ft.

Before Situation:
Areas of concentrated flow with soil erosion occuring in the flow path. There is little to no vegetation in this area.

After Situation:
The erosion control blanket is placed on concentrated flow areas and secured with ground stables. Soil erosion is minimized and vegetative cover is established.

Feature Measure: Area Covered by Mulch

Scenario Unit: Square Feet

Scenario Typical Size: 8,000.00

Scenario Total Cost: $3,256.11

Scenario Cost/Unit: $0.41

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$56.88	6	$341.28
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	6	$172.26
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	6	$182.16
Materials						
Erosion Control Blanket, biodegradable	1213	Biodegradable erosion control blanket, typically a composite of natural fibers with reinforcing polymer netting. Materials and shipping only.	Square Yard	$1.65	978	$1,613.70
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 484 - Mulching

Scenario: #5 - Tree and Shrub Mats or Mulch

Scenario Description:
Fabric or other suitable natural or synthetic mulch is installed with a new tree and shrub planting. Typically used to provide moisture control and prevent weed competition during the installation of conservation practices. Rate is per tree/shrub and assumes 1 square yard of fabric and 5 staples/tree.

Before Situation:
Site conditions vary. Typical scenario is an installation of 100 native trees and shrubs to enhance wildlife habitat. Sites are often remote and trees may not be planted in rows, requiring each tree to be mulched individually

After Situation:
Fabric squares are installed with 5 sod staples each, around individual trees and shrubs to enhance moisture retention so tree/shrub growth is minimally influenced by drought.

Feature Measure: Number of Trees Mulched

Scenario Unit: Each

Scenario Typical Size: 100.00

Scenario Total Cost: $111.00

Scenario Cost/Unit: $1.11

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.11	100	$111.00

Practice: 484 - Mulching

Scenario: #6 - Tree and Shrub Rolls

Scenario Description:
Weed barrier fabric or other suitable natural or synthetic mulch is installed with a new tree and shrub planting. Typically used to provide moisture control until trees/shrub are established..

Before Situation:
Site conditions very. Typically scenarios include new tree and shrub plantings, irrigated orchards or vineyards, or windbreaks. Water quantity and soil moisture is a concern.

After Situation:
Synthetic mulch is applied in rows with a mulch layer or by other mechanized means. Soil moisture is conserved and energy use associated with trickle irrigation is decreased.

Feature Measure: Area Covered by Mulch

Scenario Unit: Square Feet

Scenario Typical Size: 43,560.00

Scenario Total Cost: $2,686.20

Scenario Cost/Unit: $0.06

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.11	2420	$2,686.20

Practice: 484 - Mulching

Scenario: #46 - Natural Material, Partial Coverage

Scenario Description:
Application of straw mulch or other state approved natural material (such as wood chips, compost, or hay) to reduce erosion and moderate soil temperature to promote plant growth of vegetation seeded. Typically used to provide partial coverage (either in-row or between rows). Payment based on total acres mulched, assuming 3-5 ft. swatch and 10-12 ft. row spacing.

Before Situation:
Site conditions very. Typically scenarios include new tree and shrub plantings, irrigated orchards or vineyards, or annual and perennial specialty crops. Water quantity and soil moisture is a concern.

After Situation:
Straw or other natural mulch is applied in rows by hand or by mechanized means. Soil moisture is conserved, energy use associated with irrigation is decreased, and growing conditions desired vegetation is enhanced.

Feature Measure: Total Acres Mulched

Scenario Unit: Acres

Scenario Typical Size: 10.00

Scenario Total Cost: $1,095.10

Scenario Cost/Unit: $109.51

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$36.34	5	$181.70
Mulcher, straw blower	1305	Straw bale mulcher/blower to mechanically spread small or large straw bales. Labor not included.	Hours	$83.82	5	$419.10
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	5	$151.80
Materials						
Straw	1237	Small grain straw (non organic and certified organic). Includes materials only.	Ton	$137.00	2.5	$342.50

Practice: 484 - Mulching

Scenario: #70 - Hydromulch

Scenario Description:
Hydromulch is applied at a minimum of 70% coverage to a small (0.1-0.5 ac) critical area to hold soil in place until vegetation can be established. Seed source is available as part of the natural setting. If seed is needed, then do not use this practice, use 342-Critial Area Planting - hydroseeding instead. Associated practices include Critical Area Planting (342), Water and Sediment Control Basin (638), Diversion (362), Dam (402), Dike or Levee (356), Grade Stabilization Structure (410), Pond (378) and Terrace (600).

Before Situation:
Typical scenario ranges from a 0.1 to 1.0 acres. Vegetation needs to be established on water and sediment control basins, diversions, and other embankments with steep (2:1) sideslopes. Erosion potential is very high.

After Situation:
Hydromulch is applied, perhaps along with other practices in an erosion control system. Soil erosion is reduced significantly and vegetation is established to provide stabilized erosion control practices. Typical size is 1/2 acre or less. 43560 / 2 = 21780 sqft

Feature Measure: Area where hydromulch is applied

Scenario Unit: Square Feet

Scenario Typical Size: 21,780.00

Scenario Total Cost: $1,597.07

Scenario Cost/Unit: $0.07

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Seeding Operation, hydroseeder	1291	Hydroseeding with typical 1500 to 3600 gallon seeder. Includes all costs for equipment, power unit, and labor.	Acres	$1,116.88	0.5	$558.44
Materials						
Straw	1237	Small grain straw (non organic and certified organic). Includes materials only.	Ton	$137.00	2	$274.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 484 - Mulching

Scenario: #72 - Very Small Acreage (<.5 ac) Natural Material, Partial Coverage

Scenario Description:

Application of wood chip mulch or other state approved natural material (such as straw, compost, or hay) to reduce erosion, moderate soil temperature to promote plant growth of desired vegetation, or conserve soil moisture. Typically used to provide partial coverage (either in-row or between rows). Payment based on total square feet mulched, assuming 3-5 ft. swath and 5-7 ft. row spacing.

Before Situation:

Site conditions vary. Typically scenarios include within and between garden rows of annual and perennial specialty crops, new tree and shrub plantings, or new small-scale wildlife habitat plantings with plugs. Water quantity, soil moisture, and/or soil health are concerns.

After Situation:

Wood chip or other natural mulch is applied in or between rows by hand or by mechanized means. Soil moisture is conserved, energy use associated with irrigation is decreased, soil health is increased, and growing conditions of desired vegetation are enhanced.

Feature Measure: Square Feet

Scenario Unit: Square Feet

Scenario Typical Size: 1,000.00

Scenario Total Cost: $305.52

Scenario Cost/Unit: $0.31

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Aggregate, Wood Chips	1098	Includes materials, equipment and labor to transport and place.	Cubic Yards	$50.92	6	$305.52

Practice: 490 - Tree/Shrub Site Preparation

Scenario: #1 - Mechanical, Heavy Machinery

Scenario Description:
This practice involves the use of heavy machinery to treat an area in order to improve site conditions for establishing trees and/or shrubs including natural regeneration. Typical sites include trees and brush cover that is not appropriate to the site or providing the desired condition for the landowner.

Before Situation:
The site is dominated by undesirable vegetation including herbaceous plants and significant amounts of woody vegetation (trees and brush) occupying the site. There is also a significant component of woody debris onsite. Noxious and invasive species may also be present on the site. Soils are compacted as a result of past heavy equipment activities or from other land uses. Sheet and rill erosion is ocurring in areas where the soil was severely disturbed expsoing bare soil. If left untreated, soil compaction and erosion issues will result in poor survival or reduced growth of trees/shrubs to be established on the site.

After Situation:
Undesirable vegetation has been removed using mechanical methods reducing competition for target trees and/or shrubs. Woody debris has been removed to facilitate tree/shrub planting operations. Soil compaction has been alleviated, allowing penetration of moisture and allowing roots to grow properly. Site conditions are favorable for successful establishment of trees and/or shrubs.

Feature Measure: Area of Treatment

Scenario Unit: Acres

Scenario Typical Size: 40.00

Scenario Total Cost: $9,645.75

Scenario Cost/Unit: $241.14

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Heavy mechanical site prep, shearing, V-blade, K-G blading	1314	Mechanical operations that shear trees and vegetation. Requires heavy equipment such as dozers, Includes equipment, power unit and labor costs.	Acres	$170.93	24	$4,102.32
Heavy mechanical site prep, raking	1317	Mechanical operations that pushing and raking trees and vegetation. Requires heavy equipment such as dozers. Includes equipment, power unit and labor costs.	Acres	$162.69	24	$3,904.56
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	10	$486.00
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 490 - Tree/Shrub Site Preparation

Scenario: #2 - Mechanical, Light or moderate machinery

Scenario Description:
This practice involves the use of light/moderate machinery to clear above ground vegetation and to also rip/cut/lift underground root systems in order to improve site conditions for establishing trees and/or shrubs including natural regeneration. Typical sites include abandoned fields, pastures, rangelands, agricultural fields or forestlands that have been harvested.

Before Situation:
Undesirable vegetation is present on the site including herbaceous plants and sparse woody competition. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will inhibit successful establishment of target species of trees and/or shrubs. Soils are compacted as a result of harvesting heavy equipment activities or other land uses.

After Situation:
Undesirable vegetation has been removed using a bush hog to knock down stand vegetation and heavy tillage equipment is used to breakup and lift root systems, breakup plow pans (<18' deep), thus enhancing the conditions for planting and survival of trees and/or shrubs. Soil compaction has been alleviated, allowing penetration of moisture and allowing roots to grow properly. Site conditions are favorable for successful establishment of trees and/or shrubs.

Feature Measure: Area of Treatment

Scenario Unit: Acres

Scenario Typical Size: 40.00

Scenario Total Cost: $3,979.11

Scenario Cost/Unit: $99.48

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hours	$31.60	20	$632.00
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acres	$22.61	30	$678.30
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	5	$143.55
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	20	$607.20
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	8	$388.80
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 490 - Tree/Shrub Site Preparation

Scenario: #3 - Chemical, Ground Application

Scenario Description:
This practice involves the use of various herbicides applied using ground-based machinery (and some hack-n-squirt treatment of select trees) in order to remove undesirable vegetation and improve site conditions for establishing trees and/or shrubs. Typical sites include abandoned fields, pastures, rangelands, agricultural fields or forestland that was recently harvested.

Before Situation:
Undesirable vegetation is present on the site including herbaceous plants and woody vegetation. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will inhibit successful establishment of target species of trees and/or shrubs.

After Situation:
Undesirable vegetation has been treated using appropriate herbicides, reducing competition for target trees and/or shrubs. Site conditions are favorable for successful establishment of trees and/or shrubs.

Feature Measure: Area of Treatment

Scenario Unit: Acres

Scenario Typical Size: 40.00

Scenario Total Cost: $8,582.47

Scenario Cost/Unit: $214.56

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$81.82	20	$1,636.40
Chemical, ground application, forested land	1313	Chemical application performed by ground equipment where trees and terrain impede passage of wide boom sprayers. Utilizes forestry application methods that include heavy equipment such as skidders. Includes material, equipment, power unit and labor costs.	Acres	$112.55	40	$4,502.00
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	20	$972.00
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$12.66	40	$506.40
Herbicide, Triclopyor	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acres	$34.16	4	$136.64
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.61	40	$64.40
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 490 - Tree/Shrub Site Preparation

Scenario: #4 - Chemical, Aerial Application

Scenario Description:
This practice involves the use of herbicides applied by helicoptor in order to remove undesirable vegetation and improve site conditions for establishing trees and/or shrubs. This typical scenraio includes open land such as abandoned fields, pastures or forestlands that were recently harvested.

Before Situation:
Undesirable vegetation is present on the site including herbaceous plants and woody competition. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will inhibit successful establishment of target species of trees and/or shrubs.

After Situation:
Undesirable vegetation has been treated using appropriate herbicides, reducing competition for target trees and/or shrubs. Site conditions are favorable for successful establishment of trees and/or shrubs.

Feature Measure: Area of Treatment

Scenario Unit: Acres

Scenario Typical Size: 40.00

Scenario Total Cost: $2,950.48

Scenario Cost/Unit: $73.76

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, aerial application, helicopter	1991	Chemical application performed by helicopter on forest only. Includes equipment, mobilization, and labor.	Acres	$44.03	40	$1,761.20
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	8	$388.80
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$12.66	40	$506.40
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.61	40	$64.40

Practice: 490 - Tree/Shrub Site Preparation

Scenario: #5 - Chemical, Hand Application

Scenario Description:
This practice involves the use of various herbicides applied using backpack sprayer or similar equipment, and hack-n-squirt for tree control, in order to remove undesirable vegetation and improve site conditions for establishing trees and/or shrubs. Typical sites include lands such as old fields, pastures, rangelands, agricultural fields, previous forestlands that have been abandoned and are now covered with a mixture of grasses, forbs, shrubs and some remnant trees.

Before Situation:
Undesirable vegetation, including woody and herbaceous plants, occupy 100 % of the on the site. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will inhibit successful establishment of target species of trees and/or shrubs.

After Situation:
Undesirable vegetation has been treated using appropriate herbicides, reducing competition for target trees and/or shrubs. Site conditions are favorable for successful establishment of trees and/or shrubs.

Feature Measure: area of treatment

Scenario Unit: Acres

Scenario Typical Size: 40.00

Scenario Total Cost: $4,916.76

Scenario Cost/Unit: $122.92

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$81.82	40	$3,272.80
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	20	$972.00
Materials						
Herbicide, 2,4-D + Dica	331	Broadleaf herbicide labeled for cropland and pasture. Refer to WIN-PST for product names and active ingredients. Materials and shipping.	Acres	$10.90	40	$436.00
Herbicide, Imazapyr	336	Pre and post-emergent, non-selective herbicide for control of undesirable vegetation in non-crop areas. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$42.89	4	$171.56
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.61	40	$64.40

Practice: 490 - Tree/Shrub Site Preparation

Scenario: #6 - Hand site preparation

Scenario Description:
This practice typically involves grubbing all vegetation from the area of ground prior to the establishment of trees and/or shrubs. Typical sites include land such as old fields, pastures, rangelands, agricultural fields that are mostly grass or weed covered or on steep sites.

Before Situation:
The site contains undesirable vegetation including herbaceous and woody plants. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will inhibit successful establishment of target species of trees and/or shrubs. Soils are compacted as a result of recent timber harvesting activities or other land uses. If left untreated poor survival or reduced growth of trees/shrubs will occur and wildlife habitat conditions will not improve.

After Situation:
All undesirable vegetation has been grubbed out of a 4 ft by 4 ft area, leaving bare soil, at each planting spot. Tree seedlings and/or shrubs are planted at each spot. Adequate moisture, space and light is available allowing plants to grow properly. Site conditions are favorable for successful establishment of trees and/or shrubs.

Feature Measure: Area of Treatment

Scenario Unit: Acres

Scenario Typical Size: 10.00

Scenario Total Cost: $2,745.45

Scenario Cost/Unit: $274.55

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	55	$1,579.05
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	24	$1,166.40

Practice: 490 - Tree/Shrub Site Preparation

Scenario: #7 - Windbreak, Site Preparation

Scenario Description:
This practice involves the use of various chemical/tillage methods to allow for the planting of a windbreak. Site preparation includes chemically killing vegegation prior to mechanical site preparation that includes appropriate methods to allow for planting of the site which may include one or all of the following, ripping, disking, and harrowing. This practice may be applied on all lands needing treatment to facilitate establishment of trees and/or shrubs to facilitate establishment of a windbreak. Typical sites include open land such as old fields, pastures, rangelands and agricultural fields.

Before Situation:
Undesirable vegetation, including woody and herbaceous plants, is present on the site. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will inhibit successful establishment of target species of trees and/or shrubs. Soil is compacted as a result of prior land management activities.

After Situation:
Undesirable vegetation has been treated using appropriate herbicides, reducing competition for target trees and/or shrubs. Site conditions are favorable for successful establishment of trees and/or shrubs.

Feature Measure: area of treatment

Scenario Unit: Acres

Scenario Typical Size: 1.50

Scenario Total Cost: $891.02

Scenario Cost/Unit: $594.01

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	1.5	$22.32
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	1.5	$10.10
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	2	$57.42
Materials						
Herbicide, 2,4-D	330	Broadleaf herbicide labeled for cropland and pasture. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$10.10	1.5	$15.15
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$12.66	1.5	$18.99
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.61	1.5	$2.42
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 490 - Tree/Shrub Site Preparation

Scenario: #57 - Light Mechanical with Chemical

Scenario Description:

This practice involves the use of light/moderate machinery to clear above ground vegetation and to also rip/cut/lift underground root systems followed by appropriate herbicide application in order to improve site conditions for establishing trees and/or shrubs. Typical sites include small trees (<2' dbh) and brush cover on less than 60% of area that is not appropriate to the site or providing the desired condition for the landowner. Typical sites include abandoned fields, pastures, rangelands, agricultural fields or forestlands that have been harvested. This following resource concerns: soil quality degradation - compaction, soil erosion - sheet and rill, and degraded plant condition - undesirable plant productivity and health and inadequate structure and composition.

Before Situation:

Undesirable vegetation is present on the site including herbaceous plants and sparse woody competition. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will inhibit successful establishment of target species of trees and/or shrubs. Soils are compacted as a result of harvesting heavy equipment activities or other land uses.

After Situation:

Undesirable vegetation has been removed using a bush hog to knock down stand vegetation and heavy tillage equipment is used to breakup and lift root systems, breakup plow pans (<18' deep), thus enhancing the conditions for planting and survival of trees and/or shrubs. Soil compaction has been alleviated, allowing penetration of moisture and allowing roots to grow properly. Site conditions are favorable for successful establishment of trees and/or shrubs. The typical size of the practice is 5 acres. Associated practices may include: 612 Tree and Shrub Establishment, 315 Herbaceous Weed Control, 660 Tree/Shrub Pruning, 484 Mulching

Feature Measure: Area of Treatment

Scenario Unit: Acres

Scenario Typical Size: 5.00

Scenario Total Cost: $1,341.47

Scenario Cost/Unit: $268.29

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hours	$31.60	2.5	$79.00
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acres	$22.61	5	$113.05
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	5	$33.65
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	2.5	$75.90
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$12.66	5	$63.30
Herbicide, Sulfometuron & metsulfuron	344	A residual sulfonylurea herbicide that kills broadleaf weeds and some annual grasses. It is a systemic compound with foliar and soil activity. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$11.34	5	$56.70
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.61	5	$8.05
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	3	$911.82

Practice: 490 - Tree/Shrub Site Preparation

Scenario: #58 - Heavy Mechanical with Chemical

Scenario Description:

This practice involves the use of heavy machinery combined with appropriate herbicide application to treat an area in order to improve site conditions for establishing trees and/or shrubs. Typical sites include large trees(>2'dbh) and brush cover on 60% of area that is not appropriate to the site or providing the desired condition for the landowner. This practice is typically used to address the following resource concerns: degraded plant condition - undesirable plant productivity and health and inadequate structure and composition and soil quality degradation - soil erosion - sheet and rill.

Before Situation:

The site is dominated by undesirable vegetation including herbaceous plants and significant amounts of woody vegetation (trees and brush) occupying the site. There is also a significant component of woody debris onsite. Noxious and invasive species may also be present on the site. Soils are compacted as a result of past heavy equipment activities or from other land uses. Sheet and rill erosion is occurring in areas where the soil was severely disturbed exposing bare soil. If left untreated, soil compaction and erosion issues will result in poor survival or reduced growth of trees/shrubs to be established on the site.

After Situation:

Undesirable vegetation has been removed using mechanical methods reducing competition for target trees and/or shrubs. Woody debris has been removed to facilitate tree/shrub planting operations. Soil compaction has been alleviated, allowing penetration of moisture and allowing roots to grow properly. Site conditions are favorable for successful establishment of trees and/or shrubs. The typical size is 5 acres. Associated practices may include: 612 Tree and Shrub Establishment, 315Herbaceous Weed Control, 660 Tree/Shrub Pruning, 484 Mulching

Feature Measure: Area of Treatment

Scenario Unit: Acres

Scenario Typical Size: 5.00

Scenario Total Cost: $3,086.25

Scenario Cost/Unit: $617.25

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	5	$33.65
Heavy mechanical site prep, shearing, V-blade, K-G blading	1314	Mechanical operations that shear trees and vegetation. Requires heavy equipment such as dozers, Includes equipment, power unit and labor costs.	Acres	$170.93	3	$512.79
Heavy mechanical site prep, raking	1317	Mechanical operations that pushing and raking trees and vegetation. Requires heavy equipment such as dozers. Includes equipment, power unit and labor costs.	Acres	$162.69	3	$488.07
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	1	$28.71
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	1	$48.60
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$12.66	5	$63.30
Herbicide, Sulfometuron & metsulfuron	344	A residual sulfonylurea herbicide that kills broadleaf weeds and some annual grasses. It is a systemic compound with foliar and soil activity. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$11.34	5	$56.70
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.61	5	$8.05
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	2	$1,846.38

Practice: 490 - Tree/Shrub Site Preparation

Scenario: #70 - Tree-Shrub Site Prep - small acreage

Scenario Description:

This practice involves the use of various chemical and tillage methods to allow for the planting of agroforestry practices and hedgerows. Site preparation includes chemically killing vegetation prior to mechanical site preparation that includes appropriate methods to allow for planting of the site which may include one or all of the following: ripping, disking, and harrowing. This practice may be applied on all lands needing treatment to facilitate establishment of trees and shrubs to facilitate establishment of agroforestry practices (alley cropping, forest farming, riparian forest buffer, silvopasture, and windbreak) and hedgerows. Resource concern: Soil erosion - wind erosion.

Before Situation:

Undesirable vegetation, including woody and herbaceous plants, is present on the site. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will inhibit successful establishment of target species of trees or shrubs. Soil is compacted as a result of prior land management activities.

After Situation:

Undesirable vegetation has been treated using appropriate herbicides, reducing competition for target trees and shrubs. Site conditions are favorable for successful establishment of trees and shrubs. The typical size is 0.5 acre.

Feature Measure: Area of treatment

Scenario Unit: 1,000 Square Foot

Scenario Typical Size: 22.00

Scenario Total Cost: $404.24

Scenario Cost/Unit: $18.37

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	0.5	$7.44
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	0.5	$3.37
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	1	$28.71
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	1	$48.60
Materials						
Herbicide, 2,4-D	330	Broadleaf herbicide labeled for cropland and pasture. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$10.10	0.5	$5.05
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$12.66	0.5	$6.33
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.61	0.5	$0.81
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 500 - Obstruction Removal

Scenario: #1 - Removal and Disposal of Brush and Trees < 6 inch Diameter (LSR)

Scenario Description:

Remove and disposal of brush and trees < 6 inches in diameter by demolition, excavation or other means required for removal. Dispose of all brush and trees so that it does not impede subsequent work or cause onsite or offsite damage. Dispose of all brush and trees by wood chipping and or land distribution, burial at an approved location or burning. If burning is used, adhere to all state and local regulations and implement appropriate smoke management to protect public health and safety. Remove and dispose of brush and trees in order to apply conservation practices or facilitate the planned land use. Brush and tree removal will address the resource concerns of the prevention or hindrance to the installation of conservation practices or present a hazard to their use and enjoyment. Associated practices: Critical Area Planting (342), Stormwater Runoff Control (570)

Before Situation:

On any land where existing obstructions interfere with planned land use development, public safety or infrastructure. The site may be abandoned mine lands, construction sites, recreation areas, farms, ranches, and areas affected by natural disasters. This is not intended for the removal of obstructions from aquatic environments.

After Situation:

The typical area will be a 2.0 acre impaired area. The removal of brush and trees < 6 inch diameter will be performed with the use of equipment and hand labor. Dispose of all brush and trees from the obstruction removal so that it does not impede subsequent work or cause onsite or offsite damage. Revegetate or otherwise protect from erosion disturbed areas as soon as possible. Refer to NRCS Conservation Practice Standard 342, Critical Area Planting for seedbed preparation, seeding, fertilizing, and mulching requirements. The practice is to improve site conditions in order to apply conservation practices or facilitate better use of the landscape. If erosion control measures are required refer to NRCS Conservation Practice Standard 570, Stormwater Runoff Control.

Feature Measure: Land Area

Scenario Unit: Acres

Scenario Typical Size: 2.00

Scenario Total Cost: $2,969.75

Scenario Cost/Unit: $1,484.88

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$100.26	8	$802.08
Brush Chipper, 6 in. capacity	938	Brush Chipper, 6 inch capacity, typically 35 HP. Includes chipper and power unit. Labor not included.	Hours	$34.98	12	$419.76
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	8	$202.88
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	16	$459.36
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	8	$321.04
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 500 - Obstruction Removal

Scenario: #2 - Removal and Disposal of Brush and Trees > 6 inch Diameter (LSR)

Scenario Description:

Remove and disposal of brush and trees > 6 inches in diameter by demolition, excavation or other means required for removal. Dispose of all brush and trees so that it does not impede subsequent work or cause onsite or offsite damage. Dispose of all brush and trees by wood chipping and or land distribution, burial at an approved location or burning. If burning is used, adhere to all state and local regulations and implement appropriate smoke management to protect public health and safety. Remove and dispose of brush and trees in order to apply conservation practices or facilitate the planned land use. Brush and tree removal will address the resource concerns of the prevention or hindrance to the installation of conservation practices or present a hazard to their use and enjoyment. Associated practices: Critical Area Planting (342), Stormwater Runoff Control (570)

Before Situation:

On any land where existing obstructions interfere with planned land use development, public safety or infrastructure. The site may be abandoned mine lands, construction sites, recreation areas, farms, ranches, and areas affected by natural disasters. This is not intended for the removal of obstructions from aquatic environments.

After Situation:

The typical area will be a 2.0 acre impaired area. The removal of brush and trees > 6 inch diameter will be performed with the use of equipment and hand labor. Dispose of all brush and trees from the obstruction removal so that it does not impede subsequent work or cause onsite or offsite damage. Revegetate or otherwise protect from erosion disturbed areas as soon as possible. Refer to NRCS Conservation Practice Standard 342, Critical Area Planting for seedbed preparation, seeding, fertilizing, and mulching requirements. The practice is to improve site conditions in order to apply conservation practices or facilitate better use of the landscape. If erosion control measures are required refer to NRCS Conservation Practice Standard 570, Stormwater Runoff Control.

Feature Measure: Land Area

Scenario Unit: Acres

Scenario Typical Size: 2.00

Scenario Total Cost: $5,893.35

Scenario Cost/Unit: $2,946.68

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 200 HP	928	Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included.	Hours	$182.87	16	$2,925.92
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	12	$304.32
Brush Chipper, 15 in. capacity	1868	Brush Chipper, 15 inch capacity, typically 165 HP. Includes chipper and power unit. Does not include labor.	Hours	$75.99	12	$911.88
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	12	$344.52
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	16	$642.08
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 500 - Obstruction Removal

Scenario: #5 - Removal and Disposal of Concrete Slab

Scenario Description:

Remove and disposal of concrete slabs by saw cutting, demolition, excavation or other means required for removal. Dispose of concrete slabs so that it does not impede subsequent work or cause onsite or offsite damage. Dispose of all concrete slabs by removal to an approved location, or reuse location. Typical disposal is burial on site. Remove and dispose all concrete slabs in order to apply conservation practices or facilitate the planned land use. Concrete slab removal will address the resource concerns of the prevention or hindrance to the installation of conservation practices or present a hazard to their use and enjoyment. Associated practices: Critical Area Planting (342), Stormwater Runoff Control (570)

Before Situation:

On any land where existing obstructions interfere with planned land use development, public safety or infrastructure. The site may be abandoned mine lands, construction sites, recreation areas, farms, ranches, and areas affected by natural disasters. This is not intended for the removal of obstructions from aquatic environments.

After Situation:

The typical area will be a 1000 square feet of impaired land. The removal of concrete slabs will be performed by demolition, excavation or other means required for removal with the use of heavy equipment and hand labor. Dispose of all concrete slabs from the obstruction removal so that it does not impede subsequent work or cause onsite or offsite damage. Revegetate or otherwise protect from erosion disturbed areas as soon as possible. Refer to NRCS Conservation Practice Standard 342, Critical Area Planting for seedbed preparation, seeding, fertilizing, and mulching requirements. The practice is to improve site conditions in order to apply conservation practices or facilitate better use of the landscape. If erosion control measures are required refer to NRCS Conservation Practice Standard 570, Stormwater Runoff Control.

Feature Measure: Land Area

Scenario Unit: Square Feet

Scenario Typical Size: 1,000.00

Scenario Total Cost: $1,327.87

Scenario Cost/Unit: $1.33

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Track Loader, 95HP	935	Equipment and power unit costs. Labor not included.	Hours	$97.06	2	$194.12
Truck, dump, 18 CY	1400	Dump truck for moving bulk material. Typically capacity is 25 ton or 18 cubic yards. Includes equipment only.	Hours	$104.30	2	$208.60
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	4	$160.52
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 500 - Obstruction Removal

Scenario: #6 - Removal and Disposal of Structures Onsite

Scenario Description:

Remove and disposal of steel, concrete or wooden structures by demolition, excavation or other means required for removal. Removal of structures does not impede subsequent work or cause onsite or offsite damage. Dispose of all structures by removal to an approved location, or reuse location. Typical disposal is burial on site. Remove and dispose all structures in order to apply conservation practices or facilitate the planned land use. Structure removal will address the resource concerns of the prevention or hindrance to the installation of conservation practices or present a hazard to their use and enjoyment, but shall not be used for closure of waste impoundments. Associated practices: Critical Area Planting (342), Stormwater Runoff Control (570)

Before Situation:

On any land where existing obstructions interfere with planned land use development, public safety or infrastructure. The site may be abandoned mine lands, construction sites, recreation areas, farms, ranches, and areas affected by natural disasters. This is not intended for the removal of obstructions from aquatic environments or for closure of waste impoundments.

After Situation:

The typical area will be a 2000 square feet of impaired land. The removal of structures will be performed by demolition, excavation or other means required for removal with the use of heavy equipment and hand labor. Dispose of all structures from the obstruction removal so that it does not impede subsequent work or cause onsite or offsite damage. Revegetate or otherwise protect from erosion disturbed areas as soon as possible. Refer to NRCS Conservation Practice Standard 342, Critical Area Planting for seedbed preparation, seeding, fertilizing, and mulching requirements. The practice is to improve site conditions in order to apply conservation practices or facilitate better use of the landscape. If erosion control measures are required refer to NRCS Conservation Practice Standard 570, Stormwater Runoff Control.

Feature Measure: Land Area

Scenario Unit: Square Feet

Scenario Typical Size: 2,000.00

Scenario Total Cost: $4,906.56

Scenario Cost/Unit: $2.45

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	8	$1,044.08
Track Loader, 95HP	935	Equipment and power unit costs. Labor not included.	Hours	$97.06	8	$776.48
Truck, dump, 18 CY	1400	Dump truck for moving bulk material. Typically capacity is 25 ton or 18 cubic yards. Includes equipment only.	Hours	$104.30	8	$834.40
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	18	$722.34
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 500 - Obstruction Removal

Scenario: #8 - Removal and Disposal of Structures Offsite

Scenario Description:

Remove and disposal of steel, concrete or wooden structures by demolition, excavation or other means required for removal. Removal of structures does not impede subsequent work or cause onsite or offsite damage. Dispose of all steel and or concrete structures by removal to a landfill or other approved offsite location. Remove and dispose all structures in order to apply conservation practices or facilitate the planned land use. Structure removal will address the resource concerns of the prevention or hindrance to the installation of conservation practices or present a hazard to their use and enjoyment, but shall not be used for closure of waste impoundments. Associated practices: Critical Area Planting (342), Stormwater Runoff Control (570)

Before Situation:

On any land where existing obstructions interfere with planned land use development, public safety or infrastructure. The site may be abandoned mine lands, construction sites, recreation areas, farms, ranches, and areas affected by natural disasters. This is not intended for the removal of obstructions from aquatic environments or for closure of waste impoundments.

After Situation:

The typical structure to be removed is 8' deep, 10' wide and 20' long. All materials will be loaded into dump trucks and transported offsite to a landfill or other approved disposal location. The removal of structures will be performed by demolition, excavation or other means required for removal with the use of heavy equipment and hand labor. Dispose of all structures from the obstruction removal so that it does not impede subsequent work or cause onsite or offsite damage. Revegetate or otherwise protect from erosion disturbed areas as soon as possible. Refer to NRCS Conservation Practice Standard 342, Critical Area Planting for seedbed preparation, seeding, fertilizing, and mulching requirements. The practice is to improve site conditions in order to apply conservation practices or facilitate better use of the landscape. If erosion control measures are required refer to NRCS Conservation Practice Standard 570, Stormwater Runoff Control.

Feature Measure: Volume of Concrete Removed

Scenario Unit: Cubic Yards

Scenario Typical Size: 12.00

Scenario Total Cost: $2,559.08

Scenario Cost/Unit: $213.26

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hours	$145.01	2	$290.02
Truck, dump, 12 CY	1215	Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only.	Hours	$104.69	4	$418.76
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	8	$321.04
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 500 - Obstruction Removal

Scenario: #25 - Removal and Disposal of Brush and Trees, Mixed Stand

Scenario Description:

The distribution of brush and tree sizes in a stand are highly variable, making it difficult to determine an average size. Remove and disposal of brush and trees by demolition, excavation or other means required for removal. Dispose of all brush and trees so that it does not impede subsequent work or cause onsite or offsite damage. Dispose of all brush and trees by wood chipping and or land distribution, burial at an approved location or burning. If burning is used, adhere to all state and local regulations and implement appropriate smoke management to protect public health and safety. Remove and dispose of brush and trees in order to apply conservation practices or facilitate the planned land use. Brush and tree removal will address the resource concerns of the prevention or hindrance to the installation of conservation practices or present a hazard to their use and enjoyment.
Associated practices: Critical Area Planting (342), Stormwater Runoff Control (570)

Before Situation:

.On any land where existing obstructions interfere with planned land use development, public safety or infrastructure. The site may be abandoned mine lands, construction sites, recreation areas, farms, ranches, and areas affected by natural disasters. This is not intended for the removal of obstructions from aquatic environments.

After Situation:

The typical area will be a 2.0 acre impaired area. The removal of brush and trees will be performed with the use of equipment and hand labor. Dispose of all brush and trees from the obstruction removal so that it does not impede subsequent work or cause onsite or offsite damage. Revegetate or otherwise protect from erosion disturbed areas as soon as possible. Refer to NRCS Conservation Practice Standard 342, Critical Area Planting for seedbed preparation, seeding, fertilizing, and mulching requirements. The practice is to improve site conditions in order to apply conservation practices or facilitate better use of the landscape. If erosion control measures are required refer to NRCS Conservation Practice Standard 570, Stormwater Runoff Control.

Feature Measure: Land Area

Scenario Unit: Acres

Scenario Typical Size: 2.00

Scenario Total Cost: $5,112.83

Scenario Cost/Unit: $2,556.42

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 200 HP	928	Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included.	Hours	$182.87	14	$2,560.18
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	10	$253.60
Brush Chipper, 12 in. capacity	1869	Brush Chipper, 12 inch capacity, typically 130 HP. Includes chipper and power unit. Does not include labor.	Hours	$68.55	10	$685.50
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	10	$287.10
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	14	$561.82
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 500 - Obstruction Removal

Scenario: #38 - Removal and disposal of light sand and flood sediment > 30 inches

Scenario Description:
Remove and disposal of > 30' of sand and flood deposited sediments by excavation or other means required for removal. Dispose of all sand and flood deposited sediments so that it does not impede subsequent work or cause onsite or offsite damage. Dispose of all sand and flood deposited sediments by removal to an approved location, or re-use location. Sand and/or silt removal will only address sand and/or silt obstructing farmland and cropland

Before Situation:
On any land where existing obstructions interfere with the return of land to its function prior to the occurrence of a natural disaster. The site may be recreation areas, farms, ranches, or other areas affected by natural disasters. This is not intended for the removal of obstructions from aquatic environments, aquatic environment does not include land covered by flood waters that have rescinded

After Situation:
The typical area will be a 30 acre impaired area. The removal of sand and flood deposited sediments will be performed by excavation or other means required for removal with the use of heavy equipment and hand labor. Dispose of all sand and flood deposited sediments from the obstruction removal so that it does not impede subsequent work or cause onsite or offsite damage. Revegetate or otherwise protect from erosion disturbed areas as soon as possible. Refer to NRCS Conservation Practice Standard 342, Critical Area Planting for seedbed preparation, seeding, fertilizing, and mulching requirements. The practice is to improve site conditions in order to apply conservation practices or facilitate better use of the landscape.

Feature Measure: area covers by sediment greater th

Scenario Unit: Acres

Scenario Typical Size: 30.00

Scenario Total Cost: $142,867.07

Scenario Cost/Unit: $4,762.24

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$56.88	173	$9,840.24
Truck, dump, 18 CY	1400	Dump truck for moving bulk material. Typically capacity is 25 ton or 18 cubic yards. Includes equipment only.	Hours	$104.30	693	$72,279.90
Front End Loader, 130 HP	1618	Wheeled front end loader with horsepower range of 110 to 140. Equipment and power unit costs. Labor not included.	Hours	$62.95	173	$10,890.35
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	1109	$44,504.17
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	7	$5,352.41

Practice: 500 - Obstruction Removal

Scenario: #39 - Removal and disposal of heavy scattered debris

Scenario Description:

Removal of a heavy concentration of debris from farmland deposited by natural disaster. Includes the cost of all labor, equipment and disposal from area of debris. Debris is defined as woody material, rock, concrete, trash, and personal property deposited by natural disaster. This disposal shall be in accordance with all applicable Federal, State, and local laws, rules, and regulations. Dispose of all scattered debris so it does not impede farm operations or cause onsite or offsite damage. Dispose of all scattered debris by removal to an approved location, landfill, or reuse location. Scattered debris removal will only address debris obstructing farmland not in the footprint of a structure

Before Situation:

On any crop, farm or ranch land where debris from storm damage interfere with planned land use development, public safety or infrastructure. The site is covered with light debris, (wood, trees, metal, and other damage materials). Debris is scattered over a percentage of the field. This is not intended for the removal of obstructions from aquatic environments

After Situation:

Scattered debris is removed from a affected area of the field.

Feature Measure: Area of debris

Scenario Unit: Square Feet

Scenario Typical Size: 12,000.00

Scenario Total Cost: $17,414.19

Scenario Cost/Unit: $1.45

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 200 HP	928	Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included.	Hours	$182.87	30	$5,486.10
Hydraulic Excavator, .5 CY	930	Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included.	Hours	$101.18	30	$3,035.40
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	30	$189.00
Truck, dump, 12 CY	1215	Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only.	Hours	$104.69	30	$3,140.70
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	30	$861.30
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	60	$2,407.80
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	3	$2,293.89

Practice: 500 - Obstruction Removal

Scenario: #40 - Removal and disposal of light sand and flood sediment 12-30 inches

Scenario Description:

Remove and disposal of 12' to 30' of sand and flood deposited sediments by excavation or other means required for removal. Dispose of all sand and flood deposited sediments so that it does not impede subsequent work or cause onsite or offsite damage. Dispose of all sand and flood deposited sediments by removal to an approved location, or re-use location. Sand and/or silt removal will only address sand and/or silt obstructing farmland and cropland

Before Situation:

On any land where existing obstructions interfere with the return of land to its function prior to the occurrence of a natural disaster. The site may be cropland, farms, or ranches affected by natural disasters. This is not intended for the removal of obstructions from aquatic environments, aquatic environment does not include land covered by flood waters that have rescinded

After Situation:

The typical area will be a 30 acre impaired area. The removal of sand and flood deposited sediments will be performed by excavation or other means required for removal with the use of heavy equipment and hand labor. Dispose of all sand and flood deposited sediments from the obstruction removal so that it does not impede subsequent work or cause onsite or offsite damage. Revegetate or otherwise protect from erosion disturbed areas as soon as possible. Refer to NRCS Conservation Practice Standard 342, Critical Area Planting for seedbed preparation, seeding, fertilizing, and mulching requirements. The practice is to improve site conditions in order to apply conservation practices or facilitate better use of the landscape.

Feature Measure: area covered by sediment

Scenario Unit: Acres

Scenario Typical Size: 30.00

Scenario Total Cost: $98,775.01

Scenario Cost/Unit: $3,292.50

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$100.26	140	$14,036.40
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$56.88	100	$5,688.00
Truck, dump, 18 CY	1400	Dump truck for moving bulk material. Typically capacity is 25 ton or 18 cubic yards. Includes equipment only.	Hours	$104.30	400	$41,720.00
Front End Loader, 130 HP	1618	Wheeled front end loader with horsepower range of 110 to 140. Equipment and power unit costs. Labor not included.	Hours	$62.95	100	$6,295.00
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	640	$25,683.20
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	7	$5,352.41

Practice: 500 - Obstruction Removal

Scenario: #41 - Removal and disposal of light scattered debris

Scenario Description:
Removal of debris from farmland deposited by natural disaster. Includes the cost of all labor, equipment and disposal. Debris is defined as woody material, rock, trash, and personal property deposited by natural disaster. This disposal shall be in accordance with all applicable Federal, State, and local laws, rules, and regulations. Dispose of all scattered debris so it does not impede farm operations or cause onsite or offsite damage. Dispose of all scattered debris by removal to an approved location, landfill, or reuse location. Scattered debris removal will only address debris obstructing farmland not in the footprint of a structure

Before Situation:
On any crop, farm, or ranch land where debris from storm damage interfere with planned land use development, public safety or infrastructure. The site is covered with light debris, (wood, trees, metal, and other damage materials) on a percentage of the field. This is not intended for the removal of obstructions from aquatic environments

After Situation:
Debris is removed from the field and land returned to prior use

Feature Measure: Area of debris scatter

Scenario Unit: Acres

Scenario Typical Size: 10.00

Scenario Total Cost: $4,950.16

Scenario Cost/Unit: $495.02

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$56.88	10	$568.80
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	10	$253.60
Tractor, agricultural, 160 HP	1203	Agricultural tractor with horsepower range of 140 to 190. Equipment and power unit costs. Labor not included.	Hours	$100.99	10	$1,009.90
Trailer, flatbed, small	1505	Small flatbed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included.	Hours	$10.36	10	$103.60
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	20	$574.20
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	30	$910.80
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 500 - Obstruction Removal

Scenario: #47 - Removal and Disposal of Fence

Scenario Description:

Remove and disposal of all existing fences by demolition, excavation or other means required for removal. Dispose of all fence materials from the site so that it does not impede subsequent work or cause onsite or offsite damage. Dispose of all materials by removal to an approved landfill, wood chipping and land distribution, or recycling center, burial at an approved location or burning. If burning is used, implement appropriate smoke management to protect public health and safety. Remove and dispose of the unwanted fence obstruction in order to apply conservation practices such as Upland Wildlife Habitat Management (645) or facilitate the planned land use. Fence removal will address the resource concerns of the prevention or hindrance to the installation of conservation practices or present a hazard to their use and enjoyment and reduce hazards to wildlife.

Before Situation:

On any land where existing fence interferes with planned land use development, public safety, wildlife movement and habitat, or infrastructure. The site may be abandoned mine lands, construction sites, recreation areas, farms, ranches, and areas affected by natural disasters. This is not intended for the removal of obstructions from aquatic environments.

After Situation:

The typical fence will be 2640 in linear feet. The removal of the fence will be performed with the use of equipment and hand labor. Dispose of all debris from the fence removal so that it does not impede subsequent work or cause onsite or offsite damage. Revegetate or otherwise protect from erosion disturbed areas as soon as possible. Refer to NRCS Conservation Practice Standard 342, Critical Area Planting for seedbed preparation, seeding, fertilizing, and mulching requirements. The practice is to improve site conditions in order to apply conservation practices or facilitate better use of the landscape such as Upland Wildlife Habitat Management (645).

Feature Measure: Length of Fence

Scenario Unit: Feet

Scenario Typical Size: 2,640.00

Scenario Total Cost: $3,619.54

Scenario Cost/Unit: $1.37

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$56.88	20	$1,137.60
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	20	$507.20
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	21	$602.91
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	20	$607.20
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 500 - Obstruction Removal

Scenario: #117 - Removal and Disposal of Rock and or Boulders

Scenario Description:

Remove and disposal of rock and or boulders by drilling, blasting, demolition, excavation or other means required for removal. Dispose of all rocks and or boulders so that it does not impede subsequent work or cause onsite or offsite damage. Dispose of all rock and or boulders by removal to an approved location, or reuse location. Remove and dispose all rock and or boulders in order to apply conservation practices or facilitate the planned land use. Rocks and or boulders will address the resource concerns of the prevention or hindrance to the installation of conservation practices or present a hazard to their use and enjoyment.

Before Situation:

On any land where existing obstructions interfere with planned land use development, public safety or infrastructure. The site may be abandoned mine lands, construction sites, recreation areas, farms, ranches, and areas affected by natural disasters. This is not intended for the removal of obstructions from aquatic environments.

After Situation:

The typical area will be a 5.0 acre impaired area. The removal of rock and or boulders will be performed by drilling, blasting, demolition, excavation or other means required for removal with the use of heavy equipment and hand labor. Dispose of all rocks and boulders from the obstruction removal so that it does not impede subsequent work or cause onsite or offsite damage. Revegetate or otherwise protect from erosion disturbed areas as soon as possible. Refer to NRCS Conservation Practice Standard 342, Critical Area Planting for seedbed preparation, seeding, fertilizing, and mulching requirements. The practice is to improve site conditions in order to apply conservation practices or facilitate better use of the landscape.

Feature Measure: Volume

Scenario Unit: Cubic Yards

Scenario Typical Size: 500.00

Scenario Total Cost: $76,478.31

Scenario Cost/Unit: $152.96

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hydraulic Excavator, .5 CY	930	Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included.	Hours	$101.18	240	$24,283.20
Truck, dump, 18 CY	1400	Dump truck for moving bulk material. Typically capacity is 25 ton or 18 cubic yards. Includes equipment only.	Hours	$104.30	240	$25,032.00
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	241	$10,572.67
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	241	$6,919.11
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	241	$9,671.33

Practice: 500 - Obstruction Removal

Scenario: #118 - Removal and Disposal of Wood Structures

Scenario Description:

Remove and disposal of wood structures by demolition, excavation or other means required for removal. Dispose of all wood structures so that it does not impede subsequent work or cause onsite or offsite damage. Dispose of all wood structures by removal to an approved location, landfill, or reuse location. Remove and dispose all wood structures in order to apply conservation practices or facilitate the planned land use. Wood structure removal will address the resource concerns of the prevention or hindrance to the installation of conservation practices or present a hazard to their use and enjoyment.

Before Situation:

On any land where existing obstructions interfere with planned land use development, public safety or infrastructure. The site may be abandoned mine lands, construction sites, recreation areas, farms, ranches, and areas affected by natural disasters. This is not intended for the removal of obstructions from aquatic environments.

After Situation:

The typical area will be a 2000 square feet of impaired land. The removal of wood structures will be performed by demolition, excavation or other means required for removal with the use of heavy equipment and hand labor. Dispose of all wood structures from the obstruction removal so that it does not impede subsequent work or cause onsite or offsite damage. Revegetate or otherwise protect from erosion disturbed areas as soon as possible. Refer to NRCS Conservation Practice Standard 342, Critical Area Planting for seedbed preparation, seeding, fertilizing, and mulching requirements. The practice is to improve site conditions in order to apply conservation practices or facilitate better use of the landscape.

Feature Measure: Land Area

Scenario Unit: Square Feet

Scenario Typical Size: 2,000.00

Scenario Total Cost: $16,146.63

Scenario Cost/Unit: $8.07

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 200 HP	928	Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included.	Hours	$182.87	32	$5,851.84
Hydraulic Excavator, .5 CY	930	Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included.	Hours	$101.18	32	$3,237.76
Truck, dump, 18 CY	1400	Dump truck for moving bulk material. Typically capacity is 25 ton or 18 cubic yards. Includes equipment only.	Hours	$104.30	32	$3,337.60
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	33	$1,447.71
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	33	$947.43
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	33	$1,324.29

Practice: 500 - Obstruction Removal

Scenario: #129 - Removal and Disposal of Brush and Trees < 6 inch Diameter

Scenario Description:

Remove and disposal of brush and trees < 6 inches in diameter by demolition, excavation or other means required for removal. Dispose of all brush and trees so that it does not impede subsequent work or cause onsite or offsite damage. Dispose of all brush and trees by removal to an approved landfill, wood chipping and or land distribution, or recycling center, burial at an approved location or burning. If burning is used, implement appropriate smoke management to protect public health and safety. Remove and dispose of brush and trees in order to apply conservation practices or facilitate the planned land use. Brush and tree removal will address the resource concerns of the prevention or hindrance to the installation of conservation practices or present a hazard to their use and enjoyment.

Before Situation:

On any land where existing obstructions interfere with planned land use development, public safety or infrastructure. The site may be abandoned mine lands, construction sites, recreation areas, farms, ranches, and areas affected by natural disasters. This is not intended for the removal of obstructions from aquatic environments.

After Situation:

The typical area will be a 2.0 acre impaired area. The removal of brush and trees < 6 inch diameter will be performed with the use of equipment and hand labor. Dispose of all brush and trees from the obstruction removal so that it does not impede subsequent work or cause onsite or offsite damage. Revegetate or otherwise protect from erosion disturbed areas as soon as possible. Refer to NRCS Conservation Practice Standard 342, Critical Area Planting for seedbed preparation, seeding, fertilizing, and mulching requirements. The practice is to improve site conditions in order to apply conservation practices or facilitate better use of the landscape.

Feature Measure: Land Area

Scenario Unit: Acres

Scenario Typical Size: 2.00

Scenario Total Cost: $2,945.53

Scenario Cost/Unit: $1,472.77

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$100.26	8	$802.08
Brush Chipper, 6 in. capacity	938	Brush Chipper, 6 inch capacity, typically 35 HP. Includes chipper and power unit. Labor not included.	Hours	$34.98	8	$279.84
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	8	$202.88
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	9	$394.83
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	9	$258.39
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	8	$242.88
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 500 - Obstruction Removal

Scenario: #130 - Removal and Disposal of Brush and Trees > 6 inch Diameter

Scenario Description:

Remove and disposal of brush and trees > 6 inches in diameter by demolition, excavation or other means required for removal. Dispose of all brush and trees so that it does not impede subsequent work or cause onsite or offsite damage. Dispose of all brush and trees by removal to an approved landfill, wood chipping and or land distribution, or recycling center, burial at an approved location or burning. If burning is used, implement appropriate smoke management to protect public health and safety. Remove and dispose of brush and trees in order to apply conservation practices or facilitate the planned land use. Brush and tree removal will address the resource concerns of the prevention or hindrance to the installation of conservation practices or present a hazard to their use and enjoyment.

Before Situation:

On any land where existing obstructions interfere with planned land use development, public safety or infrastructure. The site may be abandoned mine lands, construction sites, recreation areas, farms, ranches, and areas affected by natural disasters. This is not intended for the removal of obstructions from aquatic environments.

After Situation:

The typical area will be a 2.0 acre impaired area. The removal of brush and trees > 6 inch diameter will be performed with the use of equipment and hand labor. Dispose of all brush and trees from the obstruction removal so that it does not impede subsequent work or cause onsite or offsite damage. Revegetate or otherwise protect from erosion disturbed areas as soon as possible. Refer to NRCS Conservation Practice Standard 342, Critical Area Planting for seedbed preparation, seeding, fertilizing, and mulching requirements. The practice is to improve site conditions in order to apply conservation practices or facilitate better use of the landscape.

Feature Measure: Land Area

Scenario Unit: Acres

Scenario Typical Size: 2.00

Scenario Total Cost: $4,875.87

Scenario Cost/Unit: $2,437.94

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 200 HP	928	Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included.	Hours	$182.87	12	$2,194.44
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	12	$304.32
Brush Chipper, 15 in. capacity	1868	Brush Chipper, 15 inch capacity, typically 165 HP. Includes chipper and power unit. Does not include labor.	Hours	$75.99	12	$911.88
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	13	$570.31
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	13	$373.23
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	13	$521.69

Practice: 500 - Obstruction Removal

Scenario: #170 - Removal and Disposal of Tile

Scenario Description:

Remove and disposal of tile by demolition, excavation or other means required for removal. Dispose of all material so that it does not impede subsequent work or cause onsite or offsite damage. Dispose of all tile by burial or removing it off site and disposing it properly. Remove and dispose of tile in order to apply conservation practices or facilitate the planned land use. Tile removed will address the resource concerns of the prevention or hindrance to the installation of another conservation practice such as a waterway where existing subsurface drainage tile must be fully removed instead of just capping to prevent impartment to the new conservation practice properly functioning such as unwanted seepage from existing subsurface tile when head pressure is present. The removal of the existing subsurface tile is critical to the new conservation practice functioning properly. Associated practices: Critical Area Planting (342), Stormwater Runoff Control (570), Water and Sediment Control Basin (638), Grassed Waterway (412), Terrace (600).

Before Situation:

On any land where existing tile interferes with planned conservation practices and needs to be removed so that they planned practices can be installed and maintained properly.

After Situation:

The typical site will be a 1000 ft of existing tile. The removal of tile will be performed with the use of equipment and hand labor. Dispose of all tile from the obstruction removal so that it does not impede subsequent work or cause onsite or offsite damage. Revegetate or otherwise protect from erosion disturbed areas as soon as possible. Refer to NRCS Conservation Practice Standard 342, Critical Area Planting for seedbed preparation, seeding, fertilizing, and mulching requirements. The practice is to improve site conditions in order to apply conservation practices or facilitate better use of the landscape. If erosion control measures are required refer to NRCS Conservation Practice Standard 570, Stormwater Runoff Control.

Feature Measure: Length of tile removed

Scenario Unit: Linear Feet

Scenario Typical Size: 1,000.00

Scenario Total Cost: $1,784.75

Scenario Cost/Unit: $1.78

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hydraulic Excavator, .5 CY	930	Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included.	Hours	$101.18	6	$607.08
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	6	$172.26
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	6	$240.78
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 511 - Forage Harvest Management

Scenario: #1 - Forage Crop Harvest Management

Scenario Description:
Improved cultural practices and recordkeeping result in better forage quality and better livestock performance.

Before Situation:
Forage cutting heights are as close to the ground as equipment will allow resulting in very low stubble height. Plant regrowth is very slow. Forage quality tests are not regularly done. Records of forage quality components, cutting heights, moisture content, and harvest schedule are not regularly kept.

After Situation:
Forage cutting heights are raised to leave at least 3-4' stubble height for cool season grasses and 6' - 8' (use a boot on the mower) for warm season grasses. Increased residual forage results in much faster plant regrowth. Forage quality tests are submitted to an accredited lab for analysis. Records of forage quality components, cutting heights, moisture content, and harvest schedule are regularly kept to track increased forage quality and improved livestock performance.

Feature Measure: acre of forage cropland

Scenario Unit: Acres

Scenario Typical Size: 30.00

Scenario Total Cost: $433.70

Scenario Cost/Unit: $14.46

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.39	1	$116.39
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	1	$43.87
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	2	$222.90
Materials						
Test, Plant Tissue Test	301	Tissue analysis for crops. Includes materials and shipping only.	Each	$25.27	2	$50.54

Practice: 511 - Forage Harvest Management

Scenario: #9 - Delayed Mowing for Ground Nesting Birds, FI

Scenario Description:

In perennial forage crops, the delaying the harvest of the first cutting to promote the reproduction of ground nesting birds. Delaying the harvest of the first cutting will benefit ground nesting birds; research at the University of Vermont showed that breeding success for declining grassland songbirds (e.g. Bobolink) went from 0 on a regularly harvested hay field to 2.8 fledglings per female per year when the the first harvest on a hayfield was delayed until August 1st. Bobolinks, Eastern Meadowlarks, and Savannah Sparrows require a nesting period to fledge young that lasts through the end of July in most parts of the eastern US. The delayed harvest results in a decrease in overall forage quality. Farmers could see as much as a 50% reduction in market value due to declines in protein (~50%) and digestibility (~20%), making the forage crop less palatable and lower in relative feed value. Due to these losses, foregone income will be included. The selected fields should be large enough to promote ground nesting birds. After young have fledged the field will be harvested for dry forages.

Before Situation:

Perennial forage crops are produced and harvested; ground nesting birds are disturbed and/or fledgling birds are killed in the process.

After Situation:

Perennial crops are harvested with a delayed mowing; forage quality is compromised, however, the survival of ground nesting birds is promoted.

Feature Measure: Increased grassland bird populatio

Scenario Unit: Acres

Scenario Typical Size: 30.00

Scenario Total Cost: $3,934.79

Scenario Cost/Unit: $131.16

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.39	1	$116.39
Foregone Income						
FI, Hay, Alfalfa	2121	Alfalfa Hay is Primary Crop	Ton	$103.89	33.7	$3,501.09
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	1	$43.87
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	2	$222.90
Materials						
Test, Plant Tissue Test	301	Tissue analysis for crops. Includes materials and shipping only.	Each	$25.27	2	$50.54

Practice: 512 - Pasture and Hay Planting

Scenario: #1 - Warm Season, one species

Scenario Description:
Establish or reseed adapted perennial native grasses to improve or maintain livestock/wildlife nutrition and health, extend the length of the grazing season, and provide soil cover to reduce erosion. Used for either conventional or no-till seeding of native grasses for pasture, hayland, and wildlife openings. This practice may be utilized for organic or regular production. This scenario assumes fertilizer, seed, equipment and labor for seed bed prep, tillage, seeding ,and spreading.

Before Situation:
Poorly managed/degraded pasture land or cropland being converted to pasture and/or hay.

After Situation:
Suitable species are established to improve forage quality and quantity and reduce soil erosion on cropland ,hayland, pasture, and/or biomass production.

Feature Measure: Acres of Forgage and Biomass Plant

Scenario Unit: Acres

Scenario Typical Size: 30.00

Scenario Total Cost: $9,928.03

Scenario Cost/Unit: $330.93

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	30	$201.90
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.61	30	$228.30
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$9.23	30	$276.90
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	30	$668.10
Materials						
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.81	1500	$1,215.00
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	1500	$1,020.00
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$26.18	60	$1,570.80
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$14.19	1	$14.19
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$12.66	30	$379.80
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$134.97	30	$4,049.10
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 512 - Pasture and Hay Planting

Scenario: #2 - Warm Season, one species without lime and fertilizer

Scenario Description:
Establish or reseed adapted perennial native grasses to improve or maintain livestock/wildlife nutrition and health, extend the length of the grazing season, and provide soil cover to reduce erosion. Used for either conventional or no-till seeding of native grasses for pasture, hayland, and wildlife openings. This practice may be utilized for organic or regular production. This scenario assumes fertility and pH are not needed. Seed, equipment and labor for seed bed prep, tillage, seeding ,and spreading are included.

Before Situation:
Poorly managed/degraded pasture land or cropland being converted to pasture and/or hay.

After Situation:
Suitable species are established to improve forage quality and quantity and reduce soil erosion on cropland ,hayland, pasture, and/or biomass production.

Feature Measure: Acres of Forgage and Biomass Plant

Scenario Unit: Acres

Scenario Typical Size: 30.00

Scenario Total Cost: $5,617.03

Scenario Cost/Unit: $187.23

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	30	$201.90
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	30	$668.10
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$14.19	1	$14.19
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$12.66	30	$379.80
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$134.97	30	$4,049.10
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 512 - Pasture and Hay Planting

Scenario: #3 - Warm Season, 2 or more species

Scenario Description:

Establish or reseed with 2 or more adapted perennial native warm season grasses to improve or maintain livestock/wildlife nutrition and health, extend the length of the grazing season, and provide soil cover to reduce erosion. Used for either conventional or no-till seeding of perennial native warm season grasses for pasture, hayland, and wildlife openings. This practice may be utilized for organic or regular production. This scenario assumes fertilizer, seed, equipment and labor for seed bed prep, tillage, seeding ,and spreading.

Before Situation:

Existing stand of perennial grasses or monoculture or no grasses present. Resource concerns may include undesireable plant productivity and health, inadequate feed and forage for livestock, soil erosion and soil quality.

After Situation:

Suitable NWSG species are established to improve forage quality and quantity and reduce soil erosion on cropland, hayland, pasture and/or biomass production.

Feature Measure: Acres of Forgage and Biomass Plant

Scenario Unit: Acres

Scenario Typical Size: 30.00

Scenario Total Cost: $13,616.53

Scenario Cost/Unit: $453.88

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	30	$446.40
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	30	$201.90
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$9.23	30	$276.90
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	30	$668.10
Materials						
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.81	1500	$1,215.00
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	1500	$1,020.00
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$26.18	60	$1,570.80
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$14.19	1	$14.19
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$12.66	30	$379.80
Native Perennial Grasses, High Density	2752	Native perennial grasses, may include a small percentage of native annual grasses for establishment only and if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping.	Acres	$250.65	30	$7,519.50
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 512 - Pasture and Hay Planting

Scenario: #4 - Warm Season, 2 or more species without lime and fertilizer

Scenario Description:

Establish or reseed with two or more adapted perennial native warm season grasses to improve or maintain livestock/wildlife nutrition and health, extend the length of the grazing season, and provide soil cover to reduce erosion. Used for either conventional or no-till seeding of perennial native warm season grasses for pasture, hayland, and wildlife openings. This practice may be utilized for organic or regular production. This scenario assumes fertility and pH are not needed. Seed, equipment and labor for seed bed prep, tillage, seeding ,and spreading are included.

Before Situation:

Existing stand of perennial grasses or monoculture or no grasses present. Resource concerns may include undesireable plant productivity and health, inadequate feed and forage for livestock, soil erosion and soil quality.

After Situation:

Suitable NWSG species are established to improve forage quality and quantity and reduce soil erosion on cropland, hayland, pasture and/or biomass production.

Feature Measure: Acres of Forgage and Biomass Plant

Scenario Unit: Acres

Scenario Typical Size: 30.00

Scenario Total Cost: $6,063.43

Scenario Cost/Unit: $202.11

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	30	$446.40
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	30	$201.90
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	30	$668.10
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$14.19	1	$14.19
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$12.66	30	$379.80
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$134.97	30	$4,049.10
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 512 - Pasture and Hay Planting

Scenario: #5 - Cool Season

Scenario Description:
Establish or reseed adapted perennial introduced cool season grasses and legumes to improve or maintain livestock/wildlife nutrition and health, extend the length of the grazing season, and provide soil cover to reduce erosion. Used for either conventional or no-till seeding of perennial introduced cool season grasses for pasture, hayland, and wildlife openings. This practice may be utilized for organic or regular production. This scenario assumes fertilizer, seed, equipment and labor for seed bed prep, tillage, seeding ,and spreading.

Before Situation:
Poor or nonexistent stand of grass species. Resource concerns may include undesireable plant productivity and health, inadequate feed and forage for livestock, soil erosion and soil quality.

After Situation:
Suitable species are established to improve forage quality and quantity and reduce soil erosion on cropland ,hayland, pasture, and/or biomass production.

Feature Measure: Acres of Forgage and Biomass Plant

Scenario Unit: Acres

Scenario Typical Size: 30.00

Scenario Total Cost: $9,549.43

Scenario Cost/Unit: $318.31

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	30	$446.40
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	30	$201.90
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.61	30	$228.30
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	30	$668.10
Materials						
Nitrogen (N), Ammonium Nitrate	69	Price per pound of N supplied by Ammonium Nitrate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.70	1200	$840.00
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.81	1500	$1,215.00
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	1500	$1,020.00
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$26.18	60	$1,570.80
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$14.19	1	$14.19
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$12.66	30	$379.80
Introduced Perennial Grasses, Legumes and/or Forbs, High Density	2749	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping.	Acres	$88.70	30	$2,661.00
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 512 - Pasture and Hay Planting

Scenario: #6 - Cool Season without lime and fertilizer

Scenario Description:

Establish or reseed adapted perennial introduced cool season grasses and legumes to improve or maintain livestock/wildlife nutrition and health, extend the length of the grazing season, and provide soil cover to reduce erosion. Used for either conventional or no-till seeding of perennial introduced cool season grasses for pasture, hayland, and wildlife openings. This practice may be utilized for organic or regular production. This scenario assumes fertility and pH are not needed. Seed, equipment and labor for seed bed prep, tillage, seeding ,and spreading are included.

Before Situation:

Poor or nonexistent stand of grass species. Resource concerns may include undesireable plant productivity and health, inadequate feed and forage for livestock, soil erosion and soil quality.

After Situation:

Suitable species are established to improve forage quality and quantity and reduce soil erosion on cropland ,hayland, pasture, and/or biomass production.

Feature Measure: Acres of Forgage and Biomass Plant

Scenario Unit: Acres

Scenario Typical Size: 30.00

Scenario Total Cost: $3,447.13

Scenario Cost/Unit: $114.90

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	30	$446.40
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	30	$201.90
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	30	$668.10
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$14.19	1	$14.19
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$12.66	30	$379.80
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$47.76	30	$1,432.80
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 512 - Pasture and Hay Planting

Scenario: #7 - Grass Establishment-Sprigging

Scenario Description:
Sprigging new grasses with sprigging application for the purpose of providing forage, increasing plant diversity, soil quality and fertility, and plant health. This practice may be utilized for organic or regular production. This scenario assumes fertilizer, sprigs, equipment and labor for seed bed prep, tillage, sprigging ,and spreading.

Before Situation:
Poor or nonexistent stand of grass species. Resource concerns may include undesireable plant productivity and health, inadequate feed and forage for livestock, soil erosion and soil quality.

After Situation:
Suitable species are established to improve forage quality and quantity and reduce soil erosion on cropland ,hayland, pasture, and/or biomass production.

Feature Measure: Acres of Forgage and Biomass Plant

Scenario Unit: Acres

Scenario Typical Size: 30.00

Scenario Total Cost: $12,268.63

Scenario Cost/Unit: $408.95

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	30	$446.40
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	30	$201.90
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.61	30	$228.30
Ground sprigging	1101	Includes costs for equipment, power unit and labor.	Acres	$66.64	30	$1,999.20
Materials						
Nitrogen (N), Ammonium Nitrate	69	Price per pound of N supplied by Ammonium Nitrate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.70	1200	$840.00
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.81	1500	$1,215.00
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	1500	$1,020.00
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$26.18	60	$1,570.80
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$14.19	1	$14.19
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$12.66	30	$379.80
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$134.97	30	$4,049.10
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 512 - Pasture and Hay Planting

Scenario: #8 - Frost Seeding

Scenario Description:
Establishment of legumes for the purpose of increasing plant diversity, soil quality and fertility, and plant health and enhancing the quality of forage. This practice may be utilized for organic or regular production. This scenario assumes fertilizer, seed, equipment and labor for seeding ,and spreading.

Before Situation:
Existing stand of perennial grasses or monoculture with no legumes present and pasture is not adequate condition score.

After Situation:
Legumes will be maintained through proper grazing management and improve plant diversity and soil quality. Pasture is at the appropriate condtion and maintained to practice standard specifications.

Feature Measure: Acres of Forgage and Biomass Plant

Scenario Unit: Acres

Scenario Typical Size: 30.00

Scenario Total Cost: $5,914.89

Scenario Cost/Unit: $197.16

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.61	30	$228.30
Seeding Operation, Broadcast, Ground	959	Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs.	Acres	$14.02	30	$420.60
Materials						
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	1500	$1,020.00
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$26.18	60	$1,570.80
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$14.19	1	$14.19
Introduced Perennial Grasses, Legumes and/or Forbs, High Density	2749	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping.	Acres	$88.70	30	$2,661.00

Practice: 512 - Pasture and Hay Planting

Scenario: #9 - Interseed

Scenario Description:
Establishment of legumes for the purpose of increasing plant diversity, soil quality and fertility, and plant health and enhancing the quality of forage. This practice may be utilized for organic or regular production. This scenario assumes fertilizer, seed, equipment and labor for no-till inter-seeding ,and spreading lime and nutrients.

Before Situation:
Existing stand of perennial grasses or monoculture with no legumes present .

After Situation:
Legumes will be maintained through proper grazing management and improve plant diversity and soil quality.

Feature Measure: Acres of Forgage and Biomass Plant

Scenario Unit: Acres

Scenario Typical Size: 30.00

Scenario Total Cost: $7,681.33

Scenario Cost/Unit: $256.04

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.61	30	$228.30
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	30	$668.10
Materials						
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.81	1500	$1,215.00
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	1500	$1,020.00
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$26.18	60	$1,570.80
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$14.19	1	$14.19
Introduced Perennial Grasses, Legumes and/or Forbs, High Density	2749	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping.	Acres	$88.70	30	$2,661.00
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 512 - Pasture and Hay Planting

Scenario: #10 - Organic Cool Season

Scenario Description:
Establish or reseed adapted perennial introduced organic cool season grasses and legumes to improve or maintain livestock/wildlife nutrition and health, extend the length of the grazing season, and provide soil cover to reduce erosion. Used for either conventional or no-till seeding of perennial introduced cool season grasses for pasture, hayland, and wildlife openings. This practice may be utilized for organic or regular production. This scenario assumes fertilizer, seed, equipment and labor for seed bed prep, tillage, seeding ,and spreading.

Before Situation:
Poor or nonexistent stand of grass species. Resource concerns may include undesireable plant productivity and health, inadequate feed and forage for livestock, soil erosion and soil quality.

After Situation:
Suitable species are established to improve forage quality and quantity and reduce soil erosion on cropland ,hayland, pasture, and/or biomass production.

Feature Measure: Acres of Forgage and Biomass Plant

Scenario Unit: Acres

Scenario Typical Size: 30.00

Scenario Total Cost: $7,375.63

Scenario Cost/Unit: $245.85

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	30	$446.40
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acres	$22.61	30	$678.30
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.61	30	$228.30
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	30	$668.10
Materials						
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$26.18	60	$1,570.80
Nitrogen, Organic	266	ORGANIC Nitrogen	Pound	$0.28	1500	$420.00
Phosphorus, Organic	267	ORGANIC Phosphorus	Pound	$0.09	1500	$135.00
Potassium, Organic	268	ORGANIC Potassium	Pound	$0.18	1500	$270.00
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$14.19	1	$14.19
Certified Organic, Perennial Grasses, Legumes and/or Forbs	2340	Perennial grasses, legumes, and/or forbs, mostly introduced but may be native, may include biennials. Used for permanent plantings such as pastures. Certified organic. Includes material and shipping only.	Acres	$88.02	30	$2,640.60
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 516 - Livestock Pipeline

Scenario: #1 - Surface HDPE or PVC Pipe

Scenario Description:

On-ground surface installation of HDPE pipeline (for seasonal use only). HDPE (IPS & Tubing) is manufactured in sizes (nominal diameter) from ??-inch to 24-inch; typical practice sizes range from 1-inch to 2-inch; and typical scenario size is 1.25-inch. Construct 2640 feet of 1.25 inch, (SDR-11.0, PE4708), HDPE Pipeline with appurtenances, installed on the ground surface for seasonal use only. The scenario unit is feet of pipe. 1.25-inch, (SDR-11.0, PE4708), HDPE pipe weighs 0.305 lb/ft. Appurtenances may include: couplings, fittings, anchors, thrust blocks, gate valves, air release valves, drain valve and are included in the cost of pipe material (additional 10% of pipe material quantity). Revegetation is not included.Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use. Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636).

Before Situation:

Water supplies need to be conveyed through pipelines for use by livestock or wildlife.

After Situation:

A sufficient amount of water is supplied to the livestock during the grazing period. The pipeline is typically a 2640 feet long, 1.25' diameter, 160 psi HDPE pipe made of materials with at least 2-3% carbon black to provide an adequate amount of ultraviolet resistance. The pipeline is laid on the ground surface next to a fenceline for protection and distributes water to the planned portion of the grazing system. All water is blown out of the pipeline before freezing temperatures occur. Where the pipeline crosses a travel lane, the pipeline is buried at least 12 inches. Manufacturer warrantees the PE pipe for 30 years. Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636).

Feature Measure: Linear Feet of Pipe

Scenario Unit: Feet

Scenario Typical Size: 2,640.00

Scenario Total Cost: $5,090.85

Scenario Cost/Unit: $1.93

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Fuser for HDPE Pipe	1383	Fusing machine for 1 to 12 inch diameter HDPE pipe joints. Equipment costs only. Does not include labor.	Hours	$28.59	6	$171.54
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	20	$574.20
Materials						
Pipe, HDPE, smooth wall, weight priced	1379	High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only.	Pound	$3.59	886	$3,180.74
Reduced Pressure Zone Device	2486	Reduced pressure principal backflow prevention device (RPZ) is a type of backflow prevention device used to protect an aquifer or water supply from contamination. Includes materials only.	Each	$864.37	1	$864.37
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	300	$300.00

Practice: 516 - Livestock Pipeline

Scenario: #2 - Shallow Buried HDPE or PVC Pipe

Scenario Description:

Shallow buried (6' to 18') installation of HDPE pipeline (for seasonal use only). HDPE (IPS & Tubing) is manufactured in sizes (nominal diameter) from ??-inch to 24-inch; typical practice sizes range from 1-inch to 2-inch; and typical scenario size is 1.25-inch. Construct 2000 feet of 1.25 inch, (SDR-11.0, PE4708), HDPE Pipeline with appurtenances, installed 6' to 18' below the ground surface with a trenching plow for protection from equipment or livestock . The scenario unit is feet of pipe. 1.25-inch, (SDR-11.0, PE4708), HDPE pipe weighs 0.305 lb/ft. Appurtenances may include: couplings, fittings, anchors, thrust blocks, gate valves, air release valves, drain valve and are included in the cost of pipe material (additional 10% of pipe material quantity). Revegetation is not included.Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use. Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636).

Before Situation:

Water supplies need to be conveyed through pipelines for use by livestock or wildlife.

After Situation:

A sufficient amount of water is supplied to the livestock during the grazing period. The pipeline is typically a 2000 foot long, 1.25' diameter, 160 psi HDPE pipe . The pipeline is buried below the ground surface (6' to 18' deep) for protection from equipment or livestock and distributes water to the planned portion of the grazing system. All water is blown out of the pipeline before freezing temperatures occur. Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636).

Feature Measure: Linear Feet of Pipe

Scenario Unit: Feet

Scenario Typical Size: 2,000.00

Scenario Total Cost: $6,475.45

Scenario Cost/Unit: $3.24

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, Pipeline Plowing	1096	Includes equipment and labor for plowing small diameter lines in common earth (< 3 inch)	Feet	$1.14	2000	$2,280.00
Fuser for HDPE Pipe	1383	Fusing machine for 1 to 12 inch diameter HDPE pipe joints. Equipment costs only. Does not include labor.	Hours	$28.59	3	$85.77
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	6	$172.26
Materials						
Pipe, HDPE, smooth wall, weight priced	1379	High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only.	Pound	$3.59	671	$2,408.89
Reduced Pressure Zone Device	2486	Reduced pressure principal backflow prevention device (RPZ) is a type of backflow prevention device used to protect an aquifer or water supply from contamination. Includes materials only.	Each	$864.37	1	$864.37
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	300	$300.00
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	2	$364.16

Practice: 516 - Livestock Pipeline

Scenario: #3 - Buried HDPE or PVC Pipe (Year Round Use), 3 to 4 feet deep

Scenario Description:

Buried installation of HDPE pipeline (year-round use), 3 to 4 feet deep (below frost line) . HDPE (IPS & Tubing) is manufactured in sizes (nominal diameter) from ??-inch to 24-inch; typical practice sizes range from 1-inch to 2-inch; and typical scenario size is 1.25-inch. Construct 1000 feet of 1.25 inch, (SDR-11.0, PE4708), HDPE Pipeline with appurtenances, installed 3 to 4 feet below the ground surface with a trenching machine or backhoe to prevent the pipeline from freezing . The scenario unit is feet of pipe. 1.25-inch, 160 psi (SDR-11.0, PE4708), HDPE pipe weighs 0.305 lb/ft. Appurtenances may include: couplings, fittings, anchors, thrust blocks, gate valves, air release valves, drain valve and are included in the cost of pipe material (additional 10% of pipe material quantity). Revegetation is not included.Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use. Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636).

Before Situation:

Water supplies need to be conveyed through pipelines for use by livestock or wildlife.

After Situation:

A sufficient amount of water is supplied to the livestock. The pipeline is typically a 1000 foot long, 1.25' diameter, 160 psi HDPE pipe . The pipeline is buried below the ground surface (3' to 4' deep) for protection from frost and distributes water to the planned portion of the grazing system. Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636).

Feature Measure: Linear Feet of Pipe

Scenario Unit: Feet

Scenario Typical Size: 1,000.00

Scenario Total Cost: $7,505.48

Scenario Cost/Unit: $7.51

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, Earth, 12 in. x 48 in.	53	Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling	Feet	$1.43	1000	$1,430.00
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	4	$264.72
Fuser for HDPE Pipe	1383	Fusing machine for 1 to 12 inch diameter HDPE pipe joints. Equipment costs only. Does not include labor.	Hours	$28.59	2	$57.18
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	4	$160.52
Materials						
Pipe, HDPE, smooth wall, weight priced	1379	High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only.	Pound	$3.59	336	$1,206.24
Freeze Proof Hydrant, > 3 ft. Bury	2393	Freeze Proof Hydrant, more than 3 foot bury. Materials only.	Each	$232.96	3	$698.88
Reduced Pressure Zone Device	2486	Reduced pressure principal backflow prevention device (RPZ) is a type of backflow prevention device used to protect an aquifer or water supply from contamination. Includes materials only.	Each	$864.37	1	$864.37
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	300	$300.00
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	3	$2,293.89

Practice: 516 - Livestock Pipeline

Scenario: #4 - Deep Buried HDPE or PVC Pipe (Year Round Use), 5 to 6 feet deep with trencher

Scenario Description:

Buried installation of HDPE pipeline (year-round use), 5 to 6 feet deep (below deep frost line) . HDPE (IPS & Tubing) is manufactured in sizes (nominal diameter) from ??-inch to 24-inch; typical practice sizes range from 1-inch to 2-inch; and typical scenario size is 1.25-inch. Construct 1000 feet of 1.25 inch, (SDR-11.0, PE4708), HDPE Pipeline with appurtenances, installed 5 to 6 feet below the ground surface with a trenching machine to prevent the pipeline from freezing . The scenario unit is feet of pipe. 1.25-inch, 160 psi (SDR-11.0, PE4708), HDPE pipe weighs 0.305 lb/ft. Appurtenances may include: couplings, fittings, anchors, thrust blocks, gate valves, air release valves, drain valve and are included in the cost of pipe material (additional 10% of pipe material quantity). Revegetation is not included.Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use. Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636).

Before Situation:

Water supplies need to be conveyed through pipelines for use by livestock or wildlife.

After Situation:

A sufficient amount of water is supplied to the livestock. The pipeline is typically a 1000 foot long, 1.25' diameter, 160 psi HDPE pipe . The pipeline is buried below the ground surface (5' to 6' deep) for protection from frost and distributes water to the planned portion of the grazing system. Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636).

Feature Measure: Linear Feet of Pipe

Scenario Unit: Feet

Scenario Typical Size: 1,000.00

Scenario Total Cost: $8,215.48

Scenario Cost/Unit: $8.22

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	4	$264.72
Fuser for HDPE Pipe	1383	Fusing machine for 1 to 12 inch diameter HDPE pipe joints. Equipment costs only. Does not include labor.	Hours	$28.59	2	$57.18
Trenching, Earth, 12 in. x 70 in.	2044	Trenching, earth, 12 inch wide x 70 inch depth, includes equipment and labor for trenching, laying 3 to 6 inch CPP drain line with envelope, and backfilling.	Feet	$2.14	1000	$2,140.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	4	$160.52
Materials						
Pipe, HDPE, smooth wall, weight priced	1379	High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only.	Pound	$3.59	336	$1,206.24
Freeze Proof Hydrant, > 3 ft. Bury	2393	Freeze Proof Hydrant, more than 3 foot bury. Materials only.	Each	$232.96	3	$698.88
Reduced Pressure Zone Device	2486	Reduced pressure principal backflow prevention device (RPZ) is a type of backflow prevention device used to protect an aquifer or water supply from contamination. Includes materials only.	Each	$864.37	1	$864.37
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	300	$300.00
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	3	$2,293.89

Practice: 516 - Livestock Pipeline

Scenario: #6 - Pipe for Filling Aquaculture Ponds

Scenario Description:

Buried installation of PE pipeline (3 to 5 ft deep) below frost line. PE (IPS) is manufactured in sizes (nominal diameter) from ??-inch to 36-inch; typical practice sizes range from 4 to 6-inch; and typical scenario size is 6-inch, DR 17. Construct 400 feet of 6 inch pipeline with appurtenances, installed 3 to 4 feet below the ground surface with a trenching machine or backhoe to prevent the pipeline from freezing . The scenario unit is feet of pipe. Includes 320 feet of 6-inch, DR 17 PE pipe which weighs 3.338 lb/ft, or a total of 1068 pounds. Also included is 80 feet of 6-inch cast iron pipe. Appurtenances are included in components. Revegetation is not included.Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use. Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636)., Aquaculture Pond (597)

Before Situation:

Planned aquaculture site does not render the natural filling of the aquaculture ponds. There is not an adequate water quantity and quality for rearing aquatic wildlife.

After Situation:

A sufficient quality/amount of water is supplied to the aquaculture pond for filling, maintaining, and cleaning. The pipeline is typically a 400 foot long, 6' diameter, DR 17 PE pipe . The pipeline is buried below the ground surface (3 to 5 ft deep) for protection from freezing. The pipe outlets into the aquaculture pond above the pond surface. Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636)., Aquaculture Pond (597)

Feature Measure: Linear Foot of Pipe

Scenario Unit: Feet

Scenario Typical Size: 400.00

Scenario Total Cost: $13,325.09

Scenario Cost/Unit: $33.31

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	2	$132.36
Fuser for HDPE Pipe	1383	Fusing machine for 1 to 12 inch diameter HDPE pipe joints. Equipment costs only. Does not include labor.	Hours	$28.59	4	$114.36
Trenching, Earth, 12 in. x 60 in.	1459	Trenching, earth, 12 inch wide x 60 inch depth, includes equipment and labor for trenching, laying 3 to 6 inch CPP drain line with envelope, and backfilling.	Feet	$1.92	400	$768.00
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	4	$175.48
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	6	$172.26
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	2	$80.26
Materials						
Pipe, HDPE, smooth wall, weight priced	1379	High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only.	Pound	$3.59	1068	$3,834.12
Swing Check Valve, metal, 8 in.	2080	8 inch swing check valve for back flow prevention, ductile iron metal body with flange mount and lever shaft. Materials only.	Each	$2,471.96	1	$2,471.96
Pipe, Cast iron, 6 in.	2279	Pipe, Cast iron, 6 inch Diameter, no hub - ASTM A74. Includes couplings 10 feet on center. Material cost only.	Feet	$41.03	80	$3,282.40
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	3	$2,293.89

Practice: 516 - Livestock Pipeline

Scenario: #47 - Deep Buried Pipe (Year Round Use), Rocky Ground requires excavator

Scenario Description:
Buried installation of HDPE pipeline (year-round use), 5 to 6 feet deep (below deep frost line) . HDPE (IPS & Tubing) is manufactured in sizes (nominal diameter) from ??-inch to 24-inch; typical practice sizes range from 1-inch to 2-inch; and typical scenario size is 1.25-inch. Construct 1000 feet of 1.25 inch, (SDR-11.0, PE4708), HDPE Pipeline with appurtenances, installed 3 to 4 feet below the ground surface with a trenching machine or backhoe to prevent the pipeline from freezing . The scenario unit is feet of pipe. 1.25-inch, 160 psi (SDR-11.0, PE4708), HDPE pipe weighs 0.305 lb/ft. Appurtenances may include: couplings, fittings, anchors, thrust blocks, gate valves, air release valves, drain valve and are included in the cost of pipe material (additional 10% of pipe material quantity). Revegetation is not included.Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use. Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636).

Before Situation:
Water supplies need to be conveyed through pipelines for use by livestock or wildlife.

After Situation:
A sufficient amount of water is supplied to the livestock. The pipeline is typically a 1000 foot long, 1.25' diameter, 160 psi HDPE pipe . The pipeline is buried below the ground surface (3' to 4' deep) for protection from frost and distributes water to the planned portion of the grazing system. Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636).

Feature Measure: Linear Feet of Pipe

Scenario Unit: Feet

Scenario Typical Size: 1,000.00

Scenario Total Cost: $9,292.10

Scenario Cost/Unit: $9.29

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	40	$2,647.20
Fuser for HDPE Pipe	1383	Fusing machine for 1 to 12 inch diameter HDPE pipe joints. Equipment costs only. Does not include labor.	Hours	$28.59	2	$57.18
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	40	$1,148.40
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	40	$1,605.20
Materials						
Pipe, HDPE, smooth wall, weight priced	1379	High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only.	Pound	$3.59	336	$1,206.24
Freeze Proof Hydrant, > 3 ft. Bury	2393	Freeze Proof Hydrant, more than 3 foot bury. Materials only.	Each	$232.96	3	$698.88
Reduced Pressure Zone Device	2486	Reduced pressure principal backflow prevention device (RPZ) is a type of backflow prevention device used to protect an aquifer or water supply from contamination. Includes materials only.	Each	$864.37	1	$864.37
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	300	$300.00
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 516 - Livestock Pipeline

Scenario: #67 - Directional Boring (Year Round Use)

Scenario Description:
200 feet of 1.25' HDPE pipeline installed by boring through road bed or under streams to meet the needs of domestic animals. Typical trencher or plowing installation is not possible due to site disturbance or environmental concerns. This item includes installation, all materials, appurtenances, and labor required to construct and install the pipeline. Appurtenances include: couplings, fittings, expansion joints, anchors, thrust blocks, gate valves, air release valves, drain valve, and pressure relief valve, and are included in the cost of pipe material. Revegetation is not included.Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use. Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636), Spring Development (574), and Prescribed Grazing (528).

Before Situation:
Water supplies need to be conveyed through pipelines for use by livestock or wildlife. Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use.

After Situation:
Pipeline(s) convey and/or distribute water to storage and/or watering facilities, for use by livestock or wildlife. Pipeline will supply adequate water for domestic animals on grazed range, pasture, or grazed forest in the northern plains. The 200 feet of 1.25' diameter HDPE pipe will be installed under roads or streams at a depth of 60' or more to avoid unnecessary disturbance and to meet the water quantity requirements of domestic animals.

Feature Measure: Length of Pipe Installed

Scenario Unit: Feet

Scenario Typical Size: 200.00

Scenario Total Cost: $8,098.59

Scenario Cost/Unit: $40.49

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	4	$264.72
Horizontal boring, Less Than Equal 3 Inch no setup	2675	Horizontal boring, Less Than Equal 3 Inch no setup. Includes equipment and labor but no additional setup.	Feet	$28.25	200	$5,650.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	4	$114.84
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	4	$160.52
Materials						
Freeze Proof Hydrant, <= 3 ft. bury	240	Freeze Proof Hydrant, 3 foot or less bury. Materials only.	Each	$160.26	1	$160.26
Pipe, HDPE, smooth wall, weight priced	1379	High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only.	Pound	$3.59	61	$218.99
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 516 - Livestock Pipeline

Scenario: #81 - Rural Water Connection Equipment (LSR)

Scenario Description:

The rural water connection includes the 4' manhole, meter, 500' of pipe, valves, and necessary installation for connecting from a rural water pipeline to a livestock distribution pipeline. ??This item includes installation, all materials, appurtenances, and labor required to construct and install the meter pit. ??This item does not include the hook-up fees to the rural water system. ??Resource Concerns: ??Inadequate Livestock Water, Inefficient Energy Use. ??Associated Practices: ??Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), Spring Development (574), and Prescribed Grazing (528).

Before Situation:

Inadequate water supply for domestic animals located on grazed range, pasture, or grazed forest.

After Situation:

A rural water connection which provides access to a reliable, high quality water supply for meeting the needs of domestic animals on grazed range, pasture, or grazed forest. The 4' manhole, meter, pipe and appurtenances will enable the pipeline to meet the quantity requirements of domestic animals.

Feature Measure: Connection

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $6,177.91

Scenario Cost/Unit: $6,177.91

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	4	$264.72
Trencher, 8 in.	936	Equipment and power unit costs. Labor not included.	Hours	$50.98	6	$305.88
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	2	$87.74
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	12	$344.52
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	10	$303.60
Materials						
Freeze Proof Hydrant, <= 3 ft. bury	240	Freeze Proof Hydrant, 3 foot or less bury. Materials only.	Each	$160.26	1	$160.26
Manhole, 4 ft x 4 ft	1053	Precast Manhole with base and top delivered. 4 feet diameter x 4 feet. Includes materials only.	Each	$1,369.50	1	$1,369.50
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.29	414	$948.06
Reduced Pressure Zone Device	2486	Reduced pressure principal backflow prevention device (RPZ) is a type of backflow prevention device used to protect an aquifer or water supply from contamination. Includes materials only.	Each	$864.37	1	$864.37
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 516 - Livestock Pipeline

Scenario: #94 - HDPE (Iron Pipe Size and Tubing), Small Scale

Scenario Description:

Below ground installation of HDPE (Iron Pipe Size &Tubing) pipeline. HDPE (IPS &Tubing) is manufactured in sizes (nominal diameter) from ??-inch to 24-inch; and typical scenario size is 1-inch. Construct 260 feet of 1-inch, Class 130 (SDR 13.5), HDPE pipeline with appurtenances, installed below ground with a minimum 2 feet of ground cover. The unit is weight of pipe material in pounds. 260 feet of 1-inch, Class 130 (SDR-13.5), HDPE weighs 0.16 lb/ft, or a total of 42 pounds. Appurtenances include: fittings, air vents, pressure relief valves, thrust blocks, risers, and inline valves, and are included in the cost of pipe material (additional 10% of pipe material quantity). Cost of appurtenances does not include flow meters or backflow preventers.Typical installation applies to soils with no special bedding requirements. Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use. Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636).

Before Situation:

Water supplies need to be conveyed through pipelines for use by livestock or wildlife.

After Situation:

Pipeline(s) convey and/or distribute water to storage and/or watering facilities, for use by livestock or wildlife.

Feature Measure: Weight of Pipe

Scenario Unit: Pound

Scenario Typical Size: 42.00

Scenario Total Cost: $2,754.28

Scenario Cost/Unit: $65.58

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, Earth, 12 in. x 48 in.	53	Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling	Feet	$1.43	260	$371.80
Fuser for HDPE Pipe	1383	Fusing machine for 1 to 12 inch diameter HDPE pipe joints. Equipment costs only. Does not include labor.	Hours	$28.59	8	$228.72
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	16	$459.36
Materials						
Pipe, HDPE, smooth wall, weight priced	1379	High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only.	Pound	$3.59	46	$165.14
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 516 - Livestock Pipeline

Scenario: #99 - Sm Scale, Surface Livestock Pipeline

Scenario Description:

On-ground surface installation of HDPE pipeline. HDPE (IPS &Tubing) is manufactured in sizes (nominal diameter) from ??- inch to 24-inch; typical practice sizes range from 1-inch to 2-inch; and typical scenario size is 1-inch. Construct 300 feet of 1 inch, (SDR-13.5, PE4708), HDPE Pipeline with appurtenances, installed on the ground surface for seasonal use. The scenario unit is in pound of pipe based on the planned length of pipe to be installed. 1-inch- 160psi, (SIDR-9, PE4708), HDPE pipe weighs 0.19 lb/ft. x 300 ft is 57 pounds (weight of pipe). Appurtenances include: couplings, fittings, pressure relief valves, gate valves, air release valves, drain valve and are included in the cost of pipe material (additional 10% of pipe material quantity). This scenario reflects the pipeline installed to a frost free hydrant that feeds a watering facility that is movable. Revegetation is not included. Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use. Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636).

Before Situation:

Water supplies need to be conveyed through pipelines for use by livestock or wildlife.

After Situation:

A sufficient amount of water is supplied to the livestock during the grazing period. The pipeline is typically a 300 feet long, 1-inch diameter, 160 psi HDPE pipe made of materials with at least 2-3% carbon black to provide an adequate amount of ultraviolet resistance. The pipeline is laid on the ground surface next to a fence line for protection and distributes water to the planned portion of the grazing system. All water is blown out of the pipeline before freezing temperatures occur. Where the pipeline crosses a travel lane, the pipeline is buried at least 12 inches. Manufacturer warrantees the PE pipe for 30 years. Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636).

Feature Measure: Weight of Pipe

Scenario Unit: Pound

Scenario Typical Size: 57.00

Scenario Total Cost: $2,172.15

Scenario Cost/Unit: $38.11

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	16	$459.36
Materials						
Pipe, HDPE, smooth wall, weight priced	1379	High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only.	Pound	$3.59	70	$251.30
Freeze Proof Hydrant, > 3 ft. Bury	2393	Freeze Proof Hydrant, more than 3 foot bury. Materials only.	Each	$232.96	1	$232.96
Reduced Pressure Zone Device	2486	Reduced pressure principal backflow prevention device (RPZ) is a type of backflow prevention device used to protect an aquifer or water supply from contamination. Includes materials only.	Each	$864.37	1	$864.37
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	2	$364.16

Practice: 516 - Livestock Pipeline

Scenario: #111 - Surface HDPE (Iron Pipe Size and Tubing), Small Scale

Scenario Description:
On-ground surface installation of HDPE (Iron Pipe Size &Tubing) pipeline. HDPE (IPS &Tubing) is manufactured in sizes (nominal diameter) from ??-inch to 24-inch; and typical scenario size is 1-inch. Construct 260 feet of 1-inch, Class 130 (SDR 13.5), HDPE pipeline with appurtenances. The unit is weight of pipe material in pounds. 260 feet of 1-inch, Class 130 (SDR-13.5), HDPE weighs 0.16 lb/ft, or a total of 42 pounds. Appurtenances include fittings, air vents, pressure relief valves, thrust blocks, risers, and inline valves, and are included in the cost of pipe material (additional 10% of pipe material quantity). Cost of appurtenances does not include flow meters or backflow preventers.Typical installation applies to soils with no special bedding requirements. Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use. Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636).

Before Situation:
Water supplies need to be conveyed through pipelines for use by livestock or wildlife.

After Situation:
Pipeline(s) convey and/or distribute water to storage and/or watering facilities, for use by livestock or wildlife.

Feature Measure: Weight of Pipe

Scenario Unit: Pound

Scenario Typical Size: 42.00

Scenario Total Cost: $872.86

Scenario Cost/Unit: $20.78

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Fuser for HDPE Pipe	1383	Fusing machine for 1 to 12 inch diameter HDPE pipe joints. Equipment costs only. Does not include labor.	Hours	$28.59	8	$228.72
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	4	$114.84
Materials						
Pipe, HDPE, smooth wall, weight priced	1379	High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only.	Pound	$3.59	46	$165.14
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	2	$364.16

Practice: 516 - Livestock Pipeline

Scenario: #169 - PVC (Iron Pipe Size)

Scenario Description:

Description: Below ground installation of PVC (Iron Pipe Size) pipeline. PVC (IPS) is manufactured in sizes (nominal diameter) from ??-inch to 36-inch; typical practice sizes range from 1-inch to 4-inch; and typical scenario size is 1??-inch. Construct one mile (5,280 feet) of 1??-inch, Schedule 40, PVC Pipeline with appurtenances, installed below ground with a minimum 1.5 feet of ground cover. The scenario unit is weight of pipe material in pounds. 5,280 feet of 1??-inch, Schedule 40, PVC pipe weighs 0.501 lb/ft, or a total of 2,645 pounds. Appurtenances include: couplings, fittings, thrust blocks, gate valves (2), air release valves (2), drain valve (1), and pressure relief valve (1), and are included in the cost of pipe material (additional 10% of pipe material quantity). Revegetation is not included.Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use. Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636).

Before Situation:

Water supplies need to be conveyed through pipelines for use by livestock or wildlife.

After Situation:

Pipeline(s) convey and/or distribute water to storage and/or watering facilities, for use by livestock or wildlife.

Feature Measure: Weight of Pipe

Scenario Unit: Pound

Scenario Typical Size: 2,645.00

Scenario Total Cost: $17,121.64

Scenario Cost/Unit: $6.47

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, Earth, 12 in. x 48 in.	53	Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling	Feet	$1.43	5280	$7,550.40
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	48	$1,378.08
Materials						
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.29	2910	$6,663.90
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 516 - Livestock Pipeline

Scenario: #170 - HDPE (Iron Pipe Size & Tubing)

Scenario Description:

Description: Below ground installation of HDPE (Iron Pipe Size & Tubing) pipeline. HDPE (IPS &Tubing) is manufactured in sizes (nominal diameter) from ??-inch to 24-inch; typical practice sizes range from 1-inch to 4-inch; and typical scenario size is 1??-inch. Construct one mile (5,280 feet) of 1??-inch, Class 200 (SDR-9.0, PE4708), HDPE Pipeline with appurtenances, installed below ground with a minimum 1.5 feet of ground cover. Typical size range of pipe installed: 1-inch to 4-inch. The scenario unit is weight of pipe material in pounds. 5,280 feet of 1??-inch, Class 200 (SDR-9.0, PE4708), HDPE pipe weighs 0.475 lb/ft, or a total of 2,508 pounds. Appurtenances include: fittings, anchors, thrust blocks, gate valves (2), air release valves (2), drain valve (1), and pressure relief valve (1), and are included in the cost of pipe material (additional 10% of pipe material quantity). Revegetation is not included.Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use. Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636).

Before Situation:

Water supplies need to be conveyed through pipelines for use by livestock or wildlife.

After Situation:

Pipeline(s) convey and/or distribute water to storage and/or watering facilities, for use by livestock or wildlife.

Feature Measure: Weight of Pipe

Scenario Unit: Pound

Scenario Typical Size: 2,508.00

Scenario Total Cost: $18,600.71

Scenario Cost/Unit: $7.42

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, Pipeline Plowing	1096	Includes equipment and labor for plowing small diameter lines in common earth (< 3 inch)	Feet	$1.14	5280	$6,019.20
Fuser for HDPE Pipe	1383	Fusing machine for 1 to 12 inch diameter HDPE pipe joints. Equipment costs only. Does not include labor.	Hours	$28.59	8	$228.72
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	32	$918.72
Materials						
Pipe, HDPE, smooth wall, weight priced	1379	High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only.	Pound	$3.59	2759	$9,904.81
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 516 - Livestock Pipeline

Scenario: #171 - Surface HDPE (Iron Pipe Size & Tubing)

Scenario Description:

Description: on-ground surface installation of HDPE (Iron Pipe Size & Tubing) pipeline. HDPE (IPS & Tubing) is manufactured in sizes (nominal diameter) from ??-inch to 24-inch; typical practice sizes range from 1-inch to 4-inch; and typical scenario size is 1??-inch. Construct one mile (5,280 feet) of 1??-inch, Class 200 (SDR-9.0, PE4708), HDPE Pipeline with appurtenances, installed on the ground surface. Typical size range of pipe installed: 1-inch to 4-inch. The scenario unit is weight of pipe material in pounds. 5,280 feet of 1??-inch, Class 200 (SDR-9.0, PE4708), HDPE pipe weighs 0.475 lb/ft, or a total of 2,508 pounds. Appurtenances include: couplings, fittings, anchors, thrust blocks, gate valves (2), air release valves (2), drain valve (1), and pressure relief valve (1), and are included in the cost of pipe material (additional 15% of pipe material quantity). Revegetation is not included.Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use. Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636).

Before Situation:

Water supplies need to be conveyed through pipelines for use by livestock or wildlife.

After Situation:

Pipeline(s) convey and/or distribute water to storage and/or watering facilities, for use by livestock or wildlife.

Feature Measure: Weight of Pipe

Scenario Unit: Pound

Scenario Typical Size: 2,508.00

Scenario Total Cost: $11,865.16

Scenario Cost/Unit: $4.73

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Fuser for HDPE Pipe	1383	Fusing machine for 1 to 12 inch diameter HDPE pipe joints. Equipment costs only. Does not include labor.	Hours	$28.59	8	$228.72
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	32	$918.72
Materials						
Pipe, HDPE, smooth wall, weight priced	1379	High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only.	Pound	$3.59	2884	$10,353.56
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	2	$364.16

Practice: 516 - Livestock Pipeline

Scenario: #172 - Steel (Iron Pipe Size)

Scenario Description:

Description: Below ground installation of Steel (Iron Pipe Size) pipeline. Steel (IPS) is manufactured in sizes (nominal diameter) from ??-inch to 36-inch; typical practice sizes range from 1-inch to 4-inch; and typical scenario size is 1??-inch. Construct one mile (5,280 feet) of 1??-inch, Schedule 40, Galvanized Steel Pipeline with appurtenances, installed below ground with a minimum 1.5 feet of ground cover. Typical size range of pipe installed: 1-inch to 4-inch. The scenario unit is weight of pipe material in pounds. 5,280 feet of 1??-inch, Schedule 40, Galvanized Steel Pipe weighs 2.718 lb/ft, or a total of 14,351 pounds. Appurtenances include: couplings, fittings, thrust blocks, gate valves (2), air release valves (2), drain valve (1), and pressure relief valve (1), and are included in the cost of pipe material (additional 10% of pipe material quantity). Revegetation is not included.Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use. Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636).

Before Situation:

Water supplies need to be conveyed through pipelines for use by livestock or wildlife.

After Situation:

Pipeline(s) convey and/or distribute water to storage and/or watering facilities, for use by livestock or wildlife.

Feature Measure: Weight of Pipe

Scenario Unit: Pound

Scenario Typical Size: 14,351.00

Scenario Total Cost: $46,680.22

Scenario Cost/Unit: $3.25

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, Earth, 12 in. x 48 in.	53	Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling	Feet	$1.43	5280	$7,550.40
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	144	$4,134.24
Materials						
Pipe, steel, smooth wall, galvanized, weight priced	1381	Steel manufactured into galvanized smooth wall pipe	Pound	$2.12	15786	$33,466.32
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 516 - Livestock Pipeline

Scenario: #173 - Surface Steel (Iron Pipe Size)

Scenario Description:

Description: on-ground surface installation of Steel (Iron Pipe Size) pipeline. Steel (IPS) is manufactured in sizes (nominal diameter) from ??-inch to 36-inch; typical practice sizes range from 1-inch to 4-inch; and typical scenario size is 1??-inch. Construct one mile (5,280 feet) of 1??-inch, Schedule 40, Galvanized Steel Pipeline with appurtenances, installed on the ground surface. Typical size range of pipe installed: 1-inch to 4-inch. The scenario unit is weight of pipe material in pounds. 5,280 feet of 1??-inch, Schedule 40, Galvanized Steel Pipe weighs 2.718 lb/ft, or a total of 14,351 pounds. Appurtenances include: couplings, fittings, expansion joints, anchors, thrust blocks, gate valves (2), air release valves (2), drain valve (1), and pressure relief valve (1), and are included in the cost of pipe material (additional 15% of pipe material quantity). Revegetation is not included.Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use. Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636).

Before Situation:

Water supplies need to be conveyed through pipelines for use by livestock or wildlife.

After Situation:

Pipeline(s) convey and/or distribute water to storage and/or watering facilities, for use by livestock or wildlife.

Feature Measure: Weight of Pipe

Scenario Unit: Pound

Scenario Typical Size: 14,351.00

Scenario Total Cost: $39,122.72

Scenario Cost/Unit: $2.73

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	144	$4,134.24
Materials						
Pipe, steel, smooth wall, galvanized, weight priced	1381	Steel manufactured into galvanized smooth wall pipe	Pound	$2.12	16504	$34,988.48

Practice: 516 - Livestock Pipeline

Scenario: #185 - Rural Water Connection Equipment

Scenario Description:
The rural water connection includes the 4' manhole, meter, 500' of pipe, valves, and necessary installation for connecting from a rural water pipeline to a livestock distribution pipeline. This item includes installation, all materials, appurtenances, and labor required to construct and install the meter pit. This item does not include the hook-up fees to the rural water system. Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use.Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636), Spring Development (574), and Prescribed Grazing (528).

Before Situation:
Inadequate water supply for domestic animals located on grazed range, pasture, or grazed forest in the northern plains region.

After Situation:
A rural water connection which provides access to a reliable, high quality water supply for meeting the needs of domestic animals on grazed range, pasture, or grazed forest in the northern plains region. The 4' manhole, meter, pipe and appurtenances will enable the pipeline to meet the quantity requirements of domestic animals.

Feature Measure: Rural Water Connection

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $5,225.80

Scenario Cost/Unit: $5,225.80

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	4	$264.72
Trencher, 8 in.	936	Equipment and power unit costs. Labor not included.	Hours	$50.98	6	$305.88
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	12	$344.52
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	10	$303.60
Materials						
Freeze Proof Hydrant, <= 3 ft. bury	240	Freeze Proof Hydrant, 3 foot or less bury. Materials only.	Each	$160.26	1	$160.26
Manhole, 4 ft x 4 ft	1053	Precast Manhole with base and top delivered. 4 feet diameter x 4 feet. Includes materials only.	Each	$1,369.50	1	$1,369.50
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.29	414	$948.06
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 516 - Livestock Pipeline

Scenario: #202 - Sm Scale, Shallow Buried Livestock Pipeline

Scenario Description:

Shallow buried (6' to 18') installation of HDPE pipeline (for seasonal use only). HDPE (IPS &Tubing) is manufactured in sizes (nominal diameter) from ??-inch to 24-inch; typical practice sizes range from 1-inch to 2-inch; and typical scenario size is 1.25-inch. Construct 300 feet of 1.25 inch, (SIDR-9, PE4710), HDPE Pipeline with appurtenances, installed 6' to 18' below the ground surface with a trenching plow for protection from equipment or livestock. The scenario unit is pounds of pipe. 1.25-inch, (SIDR-9, PE4710), HDPE pipe weighs 0.33 lb/ft x 300 ft is 99 lbs (weight of pipe). Appurtenances include couplings, fittings, anchors, thrust blocks, gate valves, air release valves, drain valve and are included in the cost of pipe material (additional 10% of pipe material quantity). This scenario reflects the pipeline installed to a frost-free hydrant that feeds a watering facility that is movable. Revegetation is not included. Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use. Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636).

Before Situation:

Water supplies need to be conveyed through pipelines for use by livestock or wildlife.

After Situation:

A sufficient amount of water is supplied to the livestock during the grazing period. The pipeline is typically a 300 foot long, 1.25' diameter, 160 psi HDPE pipe. The pipeline is buried below the ground surface (6' to 18' deep) for protection from equipment or livestock and distributes water to the planned portion of the grazing system. All water is blown out of the pipeline before freezing temperatures occur. Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636).

Feature Measure: Weight of pipe

Scenario Unit: Pound

Scenario Typical Size: 99.00

Scenario Total Cost: $3,374.36

Scenario Cost/Unit: $34.08

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, Pipeline Plowing	1096	Includes equipment and labor for plowing small diameter lines in common earth (< 3 inch)	Feet	$1.14	330	$376.20
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	20	$574.20
Materials						
Pipe, HDPE, smooth wall, weight priced	1379	High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only.	Pound	$3.59	120	$430.80
Reduced Pressure Zone Device	2486	Reduced pressure principal backflow prevention device (RPZ) is a type of backflow prevention device used to protect an aquifer or water supply from contamination. Includes materials only.	Each	$864.37	1	$864.37
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	2	$364.16
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 520 - Pond Sealing or Lining, Compacted Soil Treatment

Scenario: #67 - Soil Liner, on-site material

Scenario Description:

Construction of a compacted soil liner to reduce seepage from ponds or waste storage impoundment structures. Practice implementation includes compaction of the soil liner under proper moisture conditions to the designed liner thickness, and soil cover to protect the finished liner. Material is on site. Associated practices include Pond (378), Waste Storage Facility (313), Waste Separation Facility (632), and other waste water impoundment standards.

Before Situation:

In-place soils at site require reworking and compaction to act as a liner. An adequate quantity of soil suitable for constructing a soil liner without amendments is available at an economical haul distance. Material is on site.

After Situation:

Water conservation and environmental protection provided by limiting seepage losses from ponds or waste storage impoundments. This scenario includes a compacted liner thickness of 2.5 ft over 1.32 acre area. Mobilization is assumed to have already been accounted for in the parent standard, i.e. Pond (378) or Waste Storage Facility (313).

Feature Measure: Cubic Yards of compacted soil liner

Scenario Unit: Cubic Yards

Scenario Typical Size: 5,322.00

Scenario Total Cost: $20,992.24

Scenario Cost/Unit: $3.94

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$100.26	54	$5,414.04
Excavation, common earth, small equipment, 50 ft	1220	Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yards	$2.81	4524	$12,712.44
Roller, static, towed, tamping foot	1328	Towed static tamping foot (sheepsfoot) roller compactor typically 60 inch diameter drum. Equipment cost only. Does not include pulling equipment. Add Tractor or Dozer.	Hours	$15.19	46	$698.74
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	54	$2,167.02

Practice: 520 - Pond Sealing or Lining, Compacted Soil Treatment

Scenario: #68 - Soil Liner, Material Haul < 1 mile

Scenario Description:

Construction of a compacted soil liner, to reduce seepage from ponds or waste storage impoundment structures. Practice implementation includes compaction of the soil liner under proper moisture conditions to the designed liner thickness, and soil cover to protect the finished liner. Material haul 100 ft - 1 mile. Associated practices include Pond (378), Waste Storage Facility (313), Waste Separation Facility (632), and other waste water impoundment standards.

Before Situation:

In-place soils at site exhibit seepage rates in excess of acceptable limits. An adequate quantity of soil suitable for constructing a soil liner without amendments is available at an econical haul distance. Material haul 100 ft - 1 mile.

After Situation:

Water conservation and environmental protection provided by limiting seepage losses from ponds or waste storage impoundments. This scenario includes a compacted liner thickness of 2.5 ft over 1.32 acre area. Mobilization is assumed to have already been accounted for in the parent standard, i.e. Pond (378) or Waste Storage Facility (313).

Feature Measure: Cubic Yards of compacted soil liner

Scenario Unit: Cubic Yards

Scenario Typical Size: 5,322.00

Scenario Total Cost: $36,236.77

Scenario Cost/Unit: $6.81

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$100.26	76	$7,619.76
Dozer, 200 HP	928	Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included.	Hours	$182.87	31	$5,668.97
Scraper, self propelled, 21 CY	1208	Self propelled earthmoving scraper with 21 CY capacity. Does not include labor.	Hours	$296.28	31	$9,184.68
Excavation, common earth, side cast, large equipment	1227	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$1.61	4524	$7,283.64
Roller, static, towed, tamping foot	1328	Towed static tamping foot (sheepsfoot) roller compactor typically 60 inch diameter drum. Equipment cost only. Does not include pulling equipment. Add Tractor or Dozer.	Hours	$15.19	62	$941.78
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	138	$5,537.94

Practice: 520 - Pond Sealing or Lining, Compacted Soil Treatment

Scenario: #69 - Soil Liner, Material haul > 1 mile

Scenario Description:

Construction of a compacted soil liner, to reduce seepage from ponds or waste storage impoundment structures. Practice implementation includes compaction of the soil liner under proper moisture conditions to the designed liner thickness, and protection of the finished liner. Material haul > 1 mile. Associated practices include Pond (378), Waste Storage Facility (313), Waste Separation Facility (632), and other waste water impoundment standards.

Before Situation:

In-place soils at site exhibit seepage rates in excess of acceptable limits. An adequate quantity of soil suitable for constructing a soil liner without amendments is available at an economical haul distance.

After Situation:

Water conservation and environmental protection provided by limiting seepage losses from ponds or waste storage impoundments. This scenario includes a compacted liner thickness of 2.5 ft over 1.32 acre area. Except for the Excavator, mobilization is assumed to have already been accounted for in the parent standard, i.e. Pond (378) or Waste Storage Facility (313).

Feature Measure: Cubic Yards of compacted soil liner

Scenario Unit: Cubic Yards

Scenario Typical Size: 5,322.00

Scenario Total Cost: $48,191.27

Scenario Cost/Unit: $9.06

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	5322	$21,341.22
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	14	$1,096.20
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hours	$145.01	40	$5,800.40
Excavation, common earth, side cast, large equipment	1227	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$1.61	4524	$7,283.64
Hauling, bulk, highway truck	1615	Hauling of bulk earthfill, rockfill, waste or debris. One-way travel distance using fully loaded highway dump trucks (typically 16 CY or 20 TN capacity). Includes equipment and labor for truck only. Does not include cost for loading truck.	Cubic Yard Mile	$0.36	26610	$9,579.60
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	54	$2,167.02
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 520 - Pond Sealing or Lining, Compacted Soil Treatment

Scenario: #70 - Soil Liner, on-site material with Testing

Scenario Description:

Construction of a compacted soil liner to reduce seepage from ponds or waste storage impoundment structures. Practice implementation includes compaction of the soil liner under proper moisture conditions to the designed liner thickness, and soil cover to protect the finished liner. Material is on site. Associated practices include Pond (378), Waste Storage Facility (313), Waste Separation Facility (632), and other waste water impoundment standards.

Before Situation:

In-place soils at site require reworking and compaction to act as a liner. An adequate quantity of soil suitable for constructing a clay liner without amendments is available at an economical haul distance. Material is on site.

After Situation:

Water conservation and environmental protection provided by limiting seepage losses from ponds or waste storage impoundments. This scenario includes a compacted liner thickness of 2.5 ft over 1.32 acre area. Mobilization is assumed to have already been accounted for in the parent standard, i.e. Pond (378) or Waste Storage Facility (313). Index and Compaction testing of the soil liner is included.

Feature Measure: Cubic Yards of compacted soil liner

Scenario Unit: Cubic Yards

Scenario Typical Size: 5,322.00

Scenario Total Cost: $22,775.44

Scenario Cost/Unit: $4.28

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$100.26	54	$5,414.04
Excavation, common earth, small equipment, 50 ft	1220	Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yards	$2.81	4524	$12,712.44
Roller, static, towed, tamping foot	1328	Towed static tamping foot (sheepsfoot) roller compactor typically 60 inch diameter drum. Equipment cost only. Does not include pulling equipment. Add Tractor or Dozer.	Hours	$15.19	46	$698.74
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	54	$2,167.02
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	16	$1,783.20

Practice: 520 - Pond Sealing or Lining, Compacted Soil Treatment

Scenario: #71 - Soil Liner, Material Haul < 1 mile with testing

Scenario Description:

Construction of a compacted soil liner, to reduce seepage from ponds or waste storage impoundment structures. Practice implementation includes compaction of the soil liner under proper moisture conditions to the designed liner thickness, and soil cover to protect the finished liner. Material haul 100 ft - 1 mile. Associated practices include Pond (378), Waste Storage Facility (313), Waste Separation Facility (632), and other waste water impoundment standards.

Before Situation:

In-place soils at site exhibit seepage rates in excess of acceptable limits. An adequate quantity of soil suitable for constructing a soil liner without amendments is available at an economical haul distance. Material haul 100 ft - 1 mile.

After Situation:

Water conservation and environmental protection provided by limiting seepage losses from ponds or waste storage impoundments. This scenario includes a compacted liner thickness of 2.5 ft over 1.32 acre area. Mobilization is assumed to have already been accounted for in the parent standard, i.e. Pond (378) or Waste Storage Facility (313). Index and Compaction testing of the soil liner is included.

Feature Measure: Cubic Yards of compacted soil liner

Scenario Unit: Cubic Yards

Scenario Typical Size: 5,322.00

Scenario Total Cost: $38,019.97

Scenario Cost/Unit: $7.14

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$100.26	76	$7,619.76
Dozer, 200 HP	928	Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included.	Hours	$182.87	31	$5,668.97
Scraper, self propelled, 21 CY	1208	Self propelled earthmoving scraper with 21 CY capacity. Does not include labor.	Hours	$296.28	31	$9,184.68
Excavation, common earth, side cast, large equipment	1227	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$1.61	4524	$7,283.64
Roller, static, towed, tamping foot	1328	Towed static tamping foot (sheepsfoot) roller compactor typically 60 inch diameter drum. Equipment cost only. Does not include pulling equipment. Add Tractor or Dozer.	Hours	$15.19	62	$941.78
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	138	$5,537.94
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	16	$1,783.20

Practice: 520 - Pond Sealing or Lining, Compacted Soil Treatment

Scenario: #72 - Soil Liner, Material haul > 1 mile with testing

Scenario Description:

Construction of a compacted soil liner, to reduce seepage from ponds or waste storage impoundment structures. Practice implementation includes compaction of the soil liner under proper moisture conditions to the designed liner thickness, and protection of the finished liner. Material haul > 1 mile. Associated practices include Pond (378), Waste Storage Facility (313), Waste Separation Facility (632), and other waste water impoundment standards.

Before Situation:

In-place soils at site exhibit seepage rates in excess of acceptable limits. An adequate quantity of soil suitable for constructing a soil liner without amendments is available at an economical haul distance.

After Situation:

Water conservation and environmental protection provided by limiting seepage losses from ponds or waste storage impoundments. This scenario includes a compacted liner thickness of 2.5 ft over 1.32 acre area. Except for the Excavator, mobilization is assumed to have already been accounted for in the parent standard, i.e. Pond (378) or Waste Storage Facility (313). Index and Compaction testing of the soil liner is included.

Feature Measure: Cubic Yards of compacted soil liner

Scenario Unit: Cubic Yards

Scenario Typical Size: 5,322.00

Scenario Total Cost: $49,974.47

Scenario Cost/Unit: $9.39

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	5322	$21,341.22
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	14	$1,096.20
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hours	$145.01	40	$5,800.40
Excavation, common earth, side cast, large equipment	1227	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$1.61	4524	$7,283.64
Hauling, bulk, highway truck	1615	Hauling of bulk earthfill, rockfill, waste or debris. One-way travel distance using fully loaded highway dump trucks (typically 16 CY or 20 TN capacity). Includes equipment and labor for truck only. Does not include cost for loading truck.	Cubic Yard Mile	$0.36	26610	$9,579.60
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	54	$2,167.02
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	16	$1,783.20
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 521 - Pond Sealing or Lining, Geomembrane or Geosynthetic Clay Liner

Scenario: #2 - Flexible Membrane with geotextile and liner venting

Scenario Description:
Installation of a flexible geosynthetic membrane liner, uncovered, to reduce seepage from ponds or waste storage impoundment structures. Practice implementation includes a geotextile or soil cushion to protect the liner from subgrade damage, and liner venting. Associated practices include Pond (378), Waste Storage Facility (313), Aquaculture Pond (397). The typical scenario assumes a 70'x181' bottom dimensions,2:1 side slopes, 8ft depth and anchor trench around the perimeter (assumed 4' in material length for the anchor). This results in approximately a 1/2 acre surface area of pond/storage area. Use Subsurface Drain (606) for a drainage system. Heavy Use Area Protection (561) should be added for agitation ramps and pads.

Before Situation:
In-place soils at site exhibit seepage rates in excess of acceptable limits.

After Situation:
Water conservation and environmental protection provided by limiting seepage losses from ponds or waste storage impoundments.

Feature Measure: Surface area of liner materials (incl

Scenario Unit: Square Yard

Scenario Typical Size: 2,850.00

Scenario Total Cost: $99,564.39

Scenario Cost/Unit: $34.93

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.11	3135	$3,479.85
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$56.88	30	$1,706.40
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	136	$3,904.56
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	30	$910.80
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	36	$1,749.60
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	45	$5,015.25
Materials						
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.29	17.9	$40.99
Geonet	1778	Geosynthetic drainage liner, typically HDPE of 300 mil thickness. Includes materials and shipping only.	Square Yard	$9.86	2850	$28,101.00
Synthetic Liner, 60 mil	2109	Synthetic 60 mil HDPE, LLDPE, EPDM, etc. membrane liner material. Includes materials and shipping only.	Square Feet	$2.08	25650	$53,352.00
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	1000	$1,000.00
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 521 - Pond Sealing or Lining, Geomembrane or Geosynthetic Clay Liner

Scenario: #47 - GCL Liner

Scenario Description:
Installation of a geosynthetic clay liner to reduce seepage from ponds or waste storage impoundment structures. Practice implementation includes 1 foot of soil cover for liner protection. Associated practices include PS378 Pond, PS313 Waste Storage Facility. Heavy Use Area Protection (561) should be added for agitation ramps and pads.

Before Situation:
In-place soils at site exhibit seepage rates in excess of acceptable limits.

After Situation:
Water conservation and environmental protection provided by limiting seepage losses from ponds or waste storage impoundments.

Feature Measure: Surface area of liner materials (incl

Scenario Unit: Square Yard

Scenario Typical Size: 2,420.00

Scenario Total Cost: $28,410.84

Scenario Cost/Unit: $11.74

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	807	$3,236.07
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$56.88	10	$568.80
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	40	$1,148.40
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	20	$972.00
Materials						
Geosynthetic Clay Liner	1866	Geosynthetic Clay Liner (GCL). Includes materials and shipping only.	Square Yard	$8.85	2420	$21,417.00
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 521 - Pond Sealing or Lining, Geomembrane or Geosynthetic Clay Liner

Scenario: #48 - Flexible Membrane - intimate contact

Scenario Description:
Installation of a flexible geosynthetic membrane liner (typically 60mil), uncovered, to reduce seepage from ponds or waste storage impoundment structures. Practice implementation includes no geotextile underneath to provide direct contact with subgrade soils. Associated practices include PS378 Pond, PS313 Waste Storage Facility and PS397 Aquaculture Pond. Heavy Use Area Protection (561) should be added for agitation ramps and pads.

Before Situation:
In-place soils at site exhibit seepage rates in excess of acceptable limits.

After Situation:
Water conservation and environmental protection provided by limiting seepage losses from ponds or waste storage impoundments.

Feature Measure: Surface area of liner materials (incl

Scenario Unit: Square Yard

Scenario Typical Size: 2,420.00

Scenario Total Cost: $55,029.54

Scenario Cost/Unit: $22.74

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$56.88	20	$1,137.60
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	40	$1,754.80
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	60	$1,722.60
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	20	$607.20
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	20	$972.00
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	20	$2,229.00
Materials						
Synthetic Liner, 60 mil	2109	Synthetic 60 mil HDPE, LLDPE, EPDM, etc. membrane liner material. Includes materials and shipping only.	Square Feet	$2.08	21780	$45,302.40
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	1000	$1,000.00
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 521 - Pond Sealing or Lining, Geomembrane or Geosynthetic Clay Liner

Scenario: #49 - Flexible Membrane - medium weight liner (30-45mil)

Scenario Description:
Installation of a medium weight flexible geosynthetic membrane liner, uncovered, to reduce seepage from ponds or waste storage impoundment structures. Typical thickness of 30 - 45 mil. Practice implementation includes no geotextile underneath to provide direct contact with subgrade soils. Associated practices include PS378 Pond, PS313 Waste Storage Facility and PS397 Aquaculture Pond. Heavy Use Area Protection (561) should be added for agitation ramps and pads.

Before Situation:
In-place soils at site exhibit seepage rates in excess of acceptable limits.

After Situation:
Water conservation and environmental protection provided by limiting seepage losses from ponds or waste storage impoundments.

Feature Measure: Surface area of liner materials (incl

Scenario Unit: Square Yard

Scenario Typical Size: 2,420.00

Scenario Total Cost: $27,780.34

Scenario Cost/Unit: $11.48

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$56.88	20	$1,137.60
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	40	$1,754.80
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	60	$1,722.60
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	20	$607.20
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	20	$972.00
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	20	$2,229.00
Materials						
Synthetic Liner, 40 mil	1387	Synthetic 40 mil HDPE, LLDPE, EPDM, etc membrane liner material. Includes materials and shipping only.	Square Yard	$7.46	2420	$18,053.20
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	1000	$1,000.00
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 522 - Pond Sealing or Lining - Concrete

Scenario: #15 - Non-reinforced, Concrete Liner

Scenario Description:

A non-reinforced concrete lined waste impoundment constructed to store wastes such as manure, wastewater, and contaminated runoff as part of an agricultural waste management system. This scenario has a design storage volume of 181,411 cu.ft. (1,356,954 gals). Concrete liner is used where clay material is not available or enhanced resource protection is needed. This practice will address soil and water quality by reducing the pollution potential for surface and groundwater quality degradation. Vehicular and equipment access is addressed in Heavy Use Area Protection (561) or Access Road (560). Potential Associated Practices; Pond Sealing or Lining, Compacted Soil (520), Pond Sealing or Lining, Geomembrane or Geosynthetic Clay Liner (521), Fence (382), Subsurface Drain (606), Underground Outlet (620), Pumping Plant (533).

Before Situation:

A confined animal feeding operation without a waste management system adequate to handle the waste stream leaving the animal production facilities. Manure and other agricultural waste by-products are not being utilized or controlled in an environmentally safe manner. The waste are either accumulating at the source, or are being transported but not properly utilized or disposed of. This situation poses and environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources.

After Situation:

A concrete lined storage structure provides and environmentally safe facility for storing manure and other agricultural waste by-products. This facility provides the landowner a means of storing waste until it can be utilized in a proper manner in accordance with a nutrient management plan. Typical size: design storage volume 181,411 cu.ft.; 160 ft x 140 ft (top); 2:1 inside slopes; and 3:1 outside side slopes; total depth = 12 ft; ramp access is 10:1, 18 ft wide.

Feature Measure: Design Storage Volume

Scenario Unit: Cubic Feet

Scenario Typical Size: 181,411.00

Scenario Total Cost: $148,865.61

Scenario Cost/Unit: $0.82

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formless, non reinforced	36	Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$220.05	321	$70,636.05
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	120	$60,150.00
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	154	$962.50
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$100.26	8	$802.08
Truck, Concrete Pump	1211	Concrete pump, normally truck mounted. Use this item in association with other concrete components when job requires placement by other than normal chutes. Include drive and setup time in quantity; therefore, do not include mobilization. Includes equipment and operator.	Hours	$158.51	15	$2,377.65
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	8	$321.04
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	39	$4,346.55
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	154	$4,444.44
Waterstop, PVC, ribbed, 3/16 in x 6 in	1614	Waterstop, PVC, ribbed, 3/16 inch thick by 6 inches wide. Includes materials, equipment and labor.	Feet	$7.58	406	$3,077.48
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	60	$60.00

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 522 - Pond Sealing or Lining - Concrete

Scenario: #16 - Reinforced Concrete Liner

Scenario Description:

A reinforced concrete lined waste storage impoundment with waterstops constructed to store wastes such as manure, wastewater and contaminated runoff as part of an agricultural waste management system. This scenario has a design storage volume of 181,411 cu.ft. (1,356,954 gals). Concrete liner is used where clay material is not available or enhanced resource protection is needed. This practice will address soil and water quality by reducing the pollution potential for surface water and groundwater quality degradation. Vehicular and equipment access is addressed in Heavy Use Area Protection (561) or Access Road (560). Potential Associated Practices; Pond Sealing or Lining, Compacted Soil (520), Pond Sealing or Lining, Geomembrane or Geosynthetic Clay Liner (521), Fence (382), Subsurface Drain (606), Underground Outlet (620), Pumping Plant (533).

Before Situation:

A confined animal feeding operation without a waste management system adequate to handle the waste stream leaving the animal production facilities. Manure and other agricultural waste by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or are being transported but not properly utilized or disposed of. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources.

After Situation:

A reinforced concrete lined storage structure provides an environmentally safe facility for storing manure and other agricultural waste by-products. This facility provides the landowner a means of storing waste until it can be utilized in a proper manner in accordance with a nutrient management plan. Typical size; design storage volume 181,411 cu.ft.; 160 ft x 140 ft (top); 2:1 inside slopes; 3:1 outside side slopes; total depth = 12 ft; ramp access is 10:1 slope, 18 ft wide.

Feature Measure: Design Storage Volume

Scenario Unit: Cubic Feet

Scenario Typical Size: 181,411.00

Scenario Total Cost: $241,185.31

Scenario Cost/Unit: $1.33

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	441	$221,051.25
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	154	$962.50
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$100.26	8	$802.08
Truck, Concrete Pump	1211	Concrete pump, normally truck mounted. Use this item in association with other concrete components when job requires placement by other than normal chutes. Include drive and setup time in quantity; therefore, do not include mobilization. Includes equipment and operator.	Hours	$158.51	15	$2,377.65
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	8	$321.04
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	39	$4,346.55
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	154	$4,675.44
Waterstop, PVC, ribbed, 3/16 in x 6 in	1614	Waterstop, PVC, ribbed, 3/16 inch thick by 6 inches wide. Includes materials, equipment and labor.	Feet	$7.58	406	$3,077.48
Concrete joint slip joint	2375	Concrete joint slip dowel, # 6 rebar, 18 inch with a 9 inch plastic sleeve. Materials only.	Each	$4.35	410	$1,783.50
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	100	$100.00
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 522 - Pond Sealing or Lining - Concrete

Scenario: #17 - Liquid Tight Reinforced Concrete, Flatwork

Scenario Description:
A reinforced concrete surface provides and environmentally safe area for storing manure and other agricultural waste by-products. This facility provides the landowner a means to containing waste or redirecting polluted runoff until it can be utilized in a proper manner

Before Situation:
A confined animal feeding operation without a waste management system adequate to handle the waste stream leaving the animal production facilities. Manure and other agricultural waste by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or are being transported but not properly utilized or disposed of. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources.

After Situation:
A reinforced concrete surface provides an environmentally safe area for stacking, staging and/or redirecting manure and other agricultural waste by-products. This facility provides the landowner a means of containing waste until it can be utilized in a proper manner in accordance with a nutrient management plan. Typical size is 150ft x 100ft located on the farm headquarters where waste is produced. Typical material is 6 inches of reinforced concrete over 4 to 6 inches of sand and/or gravel with water stops and slip dowels at joints on 50 ft spacing. Concrete is 9 inches thick at the water tight joints. All needed roads must use Access Road (560). Any needed vegetation or disturbed areas must use Critical Area Planting (342). Provisions to collect, store, utilize, and or treat contaminated runoff must use any of the following associated practices; Waste Storage Facility (313), Waste Transfer (634), Waste Separation Facility (632), or Waste Treatment (629). To reduce the potential for air quality problems from particulate matter associated with livestock production, consider the use of Windbreak/Shelterbelt Establishment (380), or Herbaceous Wind Barriers (603). Other associated practices may include; Agrichemical Handling Facility (309), Composting Facility (317), Watering Facility (614), Aquaculture Ponds (397), Prescribed Grazing (528).

Feature Measure: Area of Reinforced Concrete

Scenario Unit: Square Feet

Scenario Typical Size: 15,000.00

Scenario Total Cost: $160,971.73

Scenario Cost/Unit: $10.73

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	281.2	$140,951.50
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	278	$1,114.78
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	20	$1,566.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	30	$861.30
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	20	$802.60
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	15	$1,671.75
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	278	$8,023.08
Waterstop, PVC, ribbed, 3/16 in x 6 in	1614	Waterstop, PVC, ribbed, 3/16 inch thick by 6 inches wide. Includes materials, equipment and labor.	Feet	$7.58	350	$2,653.00
Concrete joint slip joint	2375	Concrete joint slip dowel, # 6 rebar, 18 inch with a 9 inch plastic sleeve. Materials only.	Each	$4.35	354	$1,539.90
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	100	$100.00

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 522 - Pond Sealing or Lining - Concrete

Scenario: #21 - ACI-350 Liquid Tight Reinforced Concrete, Flatwork

Scenario Description:
A reinforced concrete surface (ACI-350) provides and environmentally safe area for storing manure and other agricultural waste by-products. This facility provides the landowner a means to containing waste or redirecting polluted runoff until it can be utilized in a proper manner.

Before Situation:
A confined animal feeding operation without a waste management system adequate to handle the waste stream leaving the animal production facilities. Manure and other agricultural waste by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or are being transported but not properly utilized or disposed of. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources.

After Situation:
A reinforced concrete surface (ACI-350) provides an environmentally safe area for stacking, staging and/or redirecting manure and other agricultural waste by- products. This facility provides the landowner a means of containing waste until it can be utilized in a proper manner in accordance with a nutrient management plan. Typical size is 150ft x 100ft located on the farm headquarters where waste is produced. Typical material is 6 inches of reinforced concrete (ACI-350) over 4 to 6 inches of sand and/or gravel with water stops and slip dowels at joints on 50 ft spacing. Concrete is 9 inches thick at the water tight joints. All needed roads must use Access Road (560). Any needed vegetation or disturbed areas must use Critical Area Planting (342). Provisions to collect, store, utilize, and or treat contaminated runoff must use any of the following associated practices; Waste Storage Facility (313), Waste Transfer (634), Waste Separation Facility (632), or Waste Treatment (629). To reduce the potential for air quality problems from particulate matter associated with livestock production, consider the use of Windbreak/Shelterbelt Establishment (380), or Herbaceous Wind Barriers (603). Other associated practices may include; Agrichemical Handling Facility (309), Composting Facility (317), Watering Facility (614), Aquaculture Ponds (397), Prescribed Grazing (528).

Feature Measure: Area of Reinforced Concrete

Scenario Unit: Square Feet

Scenario Typical Size: 15,000.00

Scenario Total Cost: $172,011.64

Scenario Cost/Unit: $11.47

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	278	$1,114.78
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	20	$1,566.00
Concrete, CIP, slab on grade, reinforced ACI-350	2759	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. Reinforcing steel ratio equals 0.005 meeting ACI-350	Cubic Yards	$540.51	281.2	$151,991.41
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	30	$861.30
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	20	$802.60
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	15	$1,671.75
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	278	$8,023.08
Waterstop, PVC, ribbed, 3/16 in x 6 in	1614	Waterstop, PVC, ribbed, 3/16 inch thick by 6 inches wide. Includes materials, equipment and labor.	Feet	$7.58	350	$2,653.00
Concrete joint slip joint	2375	Concrete joint slip dowel, # 6 rebar, 18 inch with a 9 inch plastic sleeve. Materials only.	Each	$4.35	354	$1,539.90
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	100	$100.00

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 522 - Pond Sealing or Lining - Concrete

Scenario: #22 - ACI-350 Reinforced Concrete Liner

Scenario Description:

A reinforced concrete (ACI-350) lined waste storage impoundment with waterstops constructed to store wastes such as manure, wastewater and contaminated runoff as part of an agricultural waste management system. This scenario has a design storage volume of 181,411 cu.ft. (1,356,954 gals). ACI-350 concrete liner is used where clay material is not available or enhanced resource protection is needed. This practice will address soil and water quality by reducing the pollution potential for surface water and groundwater quality degradation. Vehicular and equipment access is addressed in Heavy Use Area Protection (561) or Access Road (560). Potential Associated Practices; Pond Sealing or Lining, Compacted Soil (520), Pond Sealing or Lining, Geomembrane or Geosynthetic Clay Liner (521), Fence (382), Subsurface Drain (606), Underground Outlet (620), Pumping Plant (533).

Before Situation:

A confined animal feeding operation without a waste management system adequate to handle the waste stream leaving the animal production facilities. Manure and other agricultural waste by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or are being transported but not properly utilized or disposed of. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and groundwater resources.

After Situation:

An ACI-350 reinforced concrete lined storage structure provides an environmentally safe facility for storing manure and other agricultural waste by-products. This facility provides the landowner a means of storing waste until it can be utilized in a proper manner in accordance with a nutrient management plan. Typical size; design storage volume 181,411 cu.ft.; 160 ft x 140 ft (top); 2:1 inside slopes; 3:1 outside side slopes; total depth = 12 ft; ramp access is 10:1 slope, 18 ft wide.

Feature Measure: Design Storage Volume

Scenario Unit: Cubic Feet

Scenario Typical Size: 181,411.00

Scenario Total Cost: $258,498.97

Scenario Cost/Unit: $1.42

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	154	$962.50
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$100.26	8	$802.08
Truck, Concrete Pump	1211	Concrete pump, normally truck mounted. Use this item in association with other concrete components when job requires placement by other than normal chutes. Include drive and setup time in quantity; therefore, do not include mobilization. Includes equipment and operator.	Hours	$158.51	15	$2,377.65
Concrete, CIP, slab on grade, reinforced ACI-350	2759	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish. Reinforcing steel ratio equals 0.005 meeting ACI-350	Cubic Yards	$540.51	441	$238,364.91
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	8	$321.04
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	39	$4,346.55
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	154	$4,675.44
Waterstop, PVC, ribbed, 3/16 in x 6 in	1614	Waterstop, PVC, ribbed, 3/16 inch thick by 6 inches wide. Includes materials, equipment and labor.	Feet	$7.58	406	$3,077.48
Concrete joint slip joint	2375	Concrete joint slip dowel, # 6 rebar, 18 inch with a 9 inch plastic sleeve. Materials only.	Each	$4.35	410	$1,783.50
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	100	$100.00

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 527 - Sinkhole Treatment

Scenario: #2 - Complex site, high failure consequence

Scenario Description:

Installing a sinkhole protection cap on a circular sinkhole (typical 50' diameter) with a vertical opening (typical 25' depth). Complex site may include nearby conservation practices and multiple openings to fractured bedrock. The area around a sinkhole may be unstable and slippage or subsidence may occur. Sinkholes present fall hazards to people and livestock. Sinkholes are direct conduits to groundwater. Nutrient or chemical laden runoff may flow directly into sinkholes polluting groundwater. Critical Area Planting (342), Fence (382), Vertical Drain (630), Obstruction Removal (500) & Filter Strips (393) may be associated practices for this scenario.

Before Situation:

Open sinkhole poses threat to people, livestock, & wildlife. Absence of buffer allows nutrients and chemicals to flow into the open sinkhole untreated. Trash & Debris have accumulated in the sinkhole from years of use as a waste pit. Complex site includes nearby conservation practices and multiple openings to fractured bedrock. Typical Sinkhole treated is 50' Dia & 25' depth

After Situation:

Debris removed and properly disposed of off site. The sinkhole protection cap installation resolves the safety issue for people, livestock, & wildlife. The sinkhole is filled with porous material so as not to disrupt the hydrology of the karst system while filtering runoff.

Feature Measure: Sinkhole Treatment

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $19,061.85

Scenario Cost/Unit: $19,061.85

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.11	100	$111.00
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	35	$2,740.50
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hours	$145.01	40	$5,800.40
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	10	$287.10
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	75	$3,009.75
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	68	$2,064.48
Rock Riprap, graded, angular, material and shipping	1200	Graded Rock Riprap for all gradation ranges. Includes materials and local delivery within 20 miles of quarry. Placement costs are not included.	Ton	$37.44	94	$3,519.36
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 527 - Sinkhole Treatment

Scenario: #3 - Moderate site complexity

Scenario Description:

Installing a sinkhole protection cap on a circular sinkhole (typical 30' diameter) with a vertical opening (typical 15' depth). Moderate site complexity includes surface water entering bedrock. The area around a sinkhole may be unstable and slippage or subsidence may occur. Sinkholes present fall hazards to people and livestock. Sinkholes are direct conduits to groundwater. Nutrient or chemical laden runoff may flow directly into sinkholes polluting groundwater. Critical Area Planting (342), Fence (382), Vertical Drain (630), Obstruction Removal (500) & Filter Strips (393) may be associated practices for this scenario.

Before Situation:

Open sinkhole poses threat to people, livestock, & wildlife. Absence of buffer allows nutrients and chemicals to flow into the open sinkhole untreated. Trash & Debris have accumulated in the sinkhole from years of use as a waste pit. Moderate site complexity includes surface water entering bedrock. Typical Sinkhole treated is 30' Dia & 15' depth

After Situation:

Debris removed and properly disposed of off site. The sinkhole protection cap installation resolves the safety issue for people, livestock, & wildlife. The sinkhole is filled with porous material so as not to disrupt the hydrology of the karst system while filtering runoff.

Feature Measure: Sinkhole Treatment

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $11,729.99

Scenario Cost/Unit: $11,729.99

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.11	45	$49.95
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	20	$1,566.00
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hours	$145.01	30	$4,350.30
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	2	$57.42
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	50	$2,006.50
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	16	$485.76
Rock Riprap, graded, angular, material and shipping	1200	Graded Rock Riprap for all gradation ranges. Includes materials and local delivery within 20 miles of quarry. Placement costs are not included.	Ton	$37.44	45	$1,684.80
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 527 - Sinkhole Treatment

Scenario: #4 - Minor site complexity, low failure consequence

Scenario Description:

Installing a sinkhole protection cap on a circular sinkhole (typical 10' diameter) with a vertical opening (typical 8' depth). Minor site complexity on upland site, no concentrated flow entering sinkhole. The area around a sinkhole may be unstable and slippage or subsidence may occur. Sinkholes present fall hazards to people and livestock. Sinkholes are direct conduits to groundwater. Nutrient or chemical laden runoff may flow directly into sinkholes polluting groundwater. Critical Area Planting (342), Fence (382), Vertical Drain (630), Obstruction Removal (500) & Filter Strips (393) may be associated practices for this scenario.

Before Situation:

Open sinkhole poses threat to people, livestock, & wildlife. Absence of buffer allows nutrients and chemicals to flow into the open sinkhole untreated. Minor site complexity on upland site, no concentrated flow entering sinkhole. Typical Sinkhole treated is 10' Dia & 8' depth

After Situation:

The sinkhole protection cap installation resolves the safety issue for people, livestock, & wildlife. The sinkhole is filled with porous material so as not to disrupt the hydrology of the karst system while filtering runoff.

Feature Measure: Sinkhole Treatment

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $6,304.88

Scenario Cost/Unit: $6,304.88

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.11	44	$48.84
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	8	$626.40
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	16	$2,088.16
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	2	$57.42
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	24	$963.12
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	8	$242.88
Rock Riprap, graded, angular, material and shipping	1200	Graded Rock Riprap for all gradation ranges. Includes materials and local delivery within 20 miles of quarry. Placement costs are not included.	Ton	$37.44	20	$748.80
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 528 - Prescribed Grazing

Scenario: #1 - Grazing System Managed to benefit Wildlife Habitat

Scenario Description:
Development and implementation of a grazing schedule that will enhance habitat components for the identified wildlife species of concern.

Before Situation:
Wildlife cover, shelter, food, water and movement are limited due to grazingland condition. Plant health and vigor are negatively impacted by one or more of the following: poor grazing distribution, timing of grazing and inadequate rest and recovery periods. Water quality may be impacted by increased runoff and erosion. In addition reduced vegetative cover increases the opportunity for encroachment of noxious and invasive weeds.

After Situation:
A grazing system is altered and/or enhanced to benefit habitat for targeted wildlife species. Additional benefits include improved rangeland and/or pasture health, protection of sensitive areas, improved water quality and reduced risk of invasive or noxious weed encroachment.

Feature Measure: acres in precribed grazing

Scenario Unit: Acres

Scenario Typical Size: 40.00

Scenario Total Cost: $2,778.46

Scenario Cost/Unit: $69.46

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.39	1	$116.39
Equipment Installation						
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	10	$181.30
Rangeland/grassland field monitoring kit	967	Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only.	Each	$49.50	1	$49.50
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	13	$570.31
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	26	$746.46
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	10	$1,114.50

Practice: 528 - Prescribed Grazing

Scenario: #2 - Habitat Mgt. Long Term Monitoring

Scenario Description:
Development and implementation of a grazing schedule that will enhance habitat components for the identified wildlife species of concern.

Before Situation:
Wildlife cover, shelter, food, water and movement are limited due to grazingland condition. Plant health and vigor are negatively impacted by one or more of the following: poor grazing distribution, timing of grazing and inadequate rest and recovery periods. Water quality may be impacted by increased runoff and erosion. In addition reduced vegetative cover increases the opportunity for encroachment of noxious and invasive weeds.

After Situation:
A grazing system is altered and/or enhanced to benefit habitat for targeted wildlife species. Additional benefits include improved rangeland and/or pasture health, adequate rest and recovery periods, protection of sensitive areas, improved water quality and reduced risk of invasive or noxious weed encroachment. In order to achieve this, implementation of a rest/rotation or deferred grazing system will be required. A portion of the acres (20% for Sage Grouse Initiative) will be deferred during periods of critical wildlife use.

Feature Measure: <Unknown>

Scenario Unit: Acres

Scenario Typical Size: 40.00

Scenario Total Cost: $7,306.72

Scenario Cost/Unit: $182.67

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.39	1	$116.39
Equipment Installation						
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	10	$181.30
Rangeland/grassland field monitoring kit	967	Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only.	Each	$49.50	2	$99.00
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	13	$570.31
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	182	$5,225.22
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	10	$1,114.50

Practice: 528 - Prescribed Grazing

Scenario: #3 - Pasture Standard

Scenario Description:
Design and implementation of a grazing system that will enhance pasture condition and ecosystem function as well as optimize efficiency and economic return through monitoring (ex:photo points, stubble height after grazing, etc) & record keeping.

Before Situation:
Current grazing system exhibits undesirable and inefficient use of forage plants and such use may have a negative impact on pasture condition, as well as soil and water resources. Stocking rates are likely higher than the current level of production and efficiency of use can support without management changes. There is currently no monitoring plan in place to evaluate change on the landscape.

After Situation:
Prescribed grazing system is designed to protect the health and vigor of the plant communities that are in place. Livestock are managed in a way that enhances pasture condition and function through protection of sensitive areas, and efficient harvest of forage resources. Grazing system success will be evaluated through short term monitoring.

Feature Measure: <Unknown>

Scenario Unit: Acres

Scenario Typical Size: 40.00

Scenario Total Cost: $1,482.66

Scenario Cost/Unit: $37.07

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.39	1	$116.39
Equipment Installation						
Rangeland/grassland field monitoring kit	967	Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only.	Each	$49.50	1	$49.50
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	13	$570.31
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	26	$746.46

Practice: 528 - Prescribed Grazing

Scenario: #4 - Pasture Intensive

Scenario Description:
Design and implementation of a grazing system that will enhance pasture condition and ecosystem function as well as optimize efficiency and economic return through monitoring (ex: trend, composition, production, etc), record keeping.

Before Situation:
Current grazing system exhibits undesirable and inefficient use of forage plants and such use may have a negative impact on pasture condition, as well as soil and water resources. Stocking rates are likely higher than the current level of production and efficiency of use can support without management changes. There is currently no monitoring plan in place to evaluate change on the landscape.

After Situation:
Prescribed grazing system is designed to protect the health and vigor of the plant communities that are in place. Livestock are managed in a way that enhances pasture condition and function through proper rest and recovery periods, protection of sensitive areas, proper utilization, and efficient harvest of forage resources. Grazing system success will be evaluated through long term monitoring.

Feature Measure: <Unknown>

Scenario Unit: Acres

Scenario Typical Size: 40.00

Scenario Total Cost: $3,410.30

Scenario Cost/Unit: $85.26

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.39	1	$116.39
Equipment Installation						
Rangeland/grassland field monitoring kit	967	Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only.	Each	$49.50	1	$49.50
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	91	$2,612.61
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	13	$631.80

Practice: 528 - Prescribed Grazing

Scenario: #15 - Deferred Grazing, Foregone Income

Scenario Description:
Defer the pasture for 90 days and up to a growing season to manage for invasive weeds when necessary, to improve the health of the plants and/or provide nesting habitat for wildlife species. As a result of deferment, both forage quality and quantity will be reduced. These losses will be partially mitigated by this scenario. Keep records of dates out and monitor to determine when desired objectives of deferment are met.

Before Situation:
Over-grazed pasture, a pasture with a low condition score, or a newly established pasture converted from cropland with a need for proper grazing management.

After Situation:
Improve the health and vigor of the sward, through deferment of grazing and improve the nesting habitat for wildlife.

Feature Measure: Improve plant health and wildlife h

Scenario Unit: Acres

Scenario Typical Size: 40.00

Scenario Total Cost: $2,152.05

Scenario Cost/Unit: $53.80

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	5	$126.80
Trucking, moving livestock to new paddock	961	Livestock transportation costs to implement a grazing rotation using a gooseneck trailer 6 ft. 8 inch x 24 feet. Includes equipment, power unit and labor costs.	Mile	$3.90	25	$97.50
Rangeland/grassland field monitoring kit	967	Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only.	Each	$49.50	1	$49.50
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$19.94	40	$797.60
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	5	$219.35
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	30	$861.30

Practice: 528 - Prescribed Grazing

Scenario: #58 - Prescribed Grazing Management for 5 Acres or less

Scenario Description:
Plan, implement and monitor a rotational grazing systgem that will enhance and maintain ecosystem function as well as optimize efficiency and economic return on small farm grazing lands.

Before Situation:
Area is degraded due to inappropriate timing, duration, frequency and intensity of animal utilization resulting in impaired ecosystem functions. Overuse and degradation of the soil and plant resources are occuriing and animal health is compromised.

After Situation:
Planned rotational movement of animals meet ecosystem functions due to proper timing, duration, frequency and intensity of animal utilization. Monitoring is showing that animals are in balance with available forage resources and ecological function and processes for soil, water and plant resources are being improved.

Feature Measure: acres

Scenario Unit: Acres

Scenario Typical Size: 5.00

Scenario Total Cost: $1,232.99

Scenario Cost/Unit: $246.60

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.39	1	$116.39
Equipment Installation						
Rangeland/grassland field monitoring kit	967	Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only.	Each	$49.50	1	$49.50
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	6	$263.22
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	28	$803.88

Practice: 533 - Pumping Plant

Scenario: #1 - Wastewater pump and controller system

Scenario Description:
A pumping plant with floats, alarm and electronic controllers to transfer wastewater to either a treatment system, waste transfer component, waste separation system or waste storage facility. Resource concerns: Water Quality degradation, excessive nutrients are impacting surface and groundwater.Associated Practices: 634-Waste Transfer, 632-Waste Separation, 313-Waste Storage Facility, 629-Waste Treatment, 635-Vegetative Treatment Area

Before Situation:
Silage leachate, milkhouse effluent or lot runoff are impacting surface or ground water resources

After Situation:
Liquid wastes that have been collected through a waste transfer system are now efficiently pumped to an appropriate treatment or storage facility.

Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $9,713.60

Scenario Cost/Unit: $9,713.60

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	3	$391.53
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	6	$263.22
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	6	$172.26
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	3	$120.39
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	4	$194.40
Materials						
Pump, <= 5 HP, pump and motor, fixed cost portion	1009	Fixed cost portion of a pump less than or equal to 5 HP pump and motor. This portion is the base cost and is not dependent on horsepower. The total cost of any pump will include this fixed cost plus a variable cost portion. Includes the motor and controls for materials and shipping only.	Each	$1,659.42	1	$1,659.42
Pump, <= 5 HP, pump and motor, variable cost portion	1010	Variable cost portion of a pump less than or equal to 5 HP pump and motor. This portion is dependent on the total horsepower for the pump. The total cost of any pump will include this variable cost plus the fixed cost portion. Includes the motor and controls for materials and shipping only.	Horsepower	$447.82	1	$447.82
Pumping Plant Pit, Concrete, 1200 Gallon	1922	Precast concrete septic tank structure, 1200 gal capacity, with access port and ladder. Materials only.	Each	$1,600.15	1	$1,600.15
Effluent pump appertenances	2162	Controller for pump system with timer, event counter and run time meter, 3 float switch assembly and alarm system with electrical connections.	Each	$4,099.78	1	$4,099.78
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 533 - Pumping Plant

Scenario: #2 - 313 Subsurface Drain Pump with sump chamber

Scenario Description:
A 1 Hp submersible electric-powered pump is installed in manhole. It is used for transferring groundwater collected from a 313 waste storage facility perimeter drain system to a surface outlet or back into the Waste Storage Facility. Resource Concerns: Water Quality degradation - Excess nutrients in surface and ground waters;Associated Practices include: 313 - Waste Storage Facility; 634 - Waste Transfer; 606 - Subsurface Drain; 620 Underground Outlet

Before Situation:

Waste Storage: Groundwater needs to be removed from the foundation of the waste storage facility in order to protect the storage liner.

After Situation:

Waste Storage: Groundwater that has been collected through a perimeter drain system is now efficiently transferred to an appropriate outlet.

Feature Measure: number of pumping plants

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $8,372.75

Scenario Cost/Unit: $8,372.75

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	4	$522.04
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	2	$87.74
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	4	$114.84
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	4	$160.52
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	2	$97.20
Materials						
Pump, <= 5 HP, pump and motor, fixed cost portion	1009	Fixed cost portion of a pump less than or equal to 5 HP pump and motor. This portion is the base cost and is not dependent on horsepower. The total cost of any pump will include this fixed cost plus a variable cost portion. Includes the motor and controls for materials and shipping only.	Each	$1,659.42	1	$1,659.42
Pump, <= 5 HP, pump and motor, variable cost portion	1010	Variable cost portion of a pump less than or equal to 5 HP pump and motor. This portion is dependent on the total horsepower for the pump. The total cost of any pump will include this variable cost plus the fixed cost portion. Includes the motor and controls for materials and shipping only.	Horsepower	$447.82	1	$447.82
Switches and Controls, Wi-Fi system and software	1194	Software with built-in cellular or Wi-Fi communication commonly used to control pumps and irrigation systems	Each	$786.92	1	$786.92
Manhole, 4 ft x 10 ft	2136	Precast Manhole with base and top delivered. 4 feet diameter x 10 feet depth. Includes materials, equipment and labor.	Each	$3,573.06	1	$3,573.06
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 533 - Pumping Plant

Scenario: #3 - Milkhouse or Silage waste Pump

Scenario Description:
A pumping plant to transfer liquid waste that may contain limited solids, including but not limited to milking center waste and silage leachate, to either a treatment system or a waste storage facility.Contract 634 waste transfer for the reception tank if not already existing. Resource Concerns - Water Quality degradation - Excess nutrients in surface and ground waters. Associated Practices: 634 - Waste Transfer; 635 - Vegetated Treatment Area; 629 - Waste Treatment; 313 - Waste Storage Facility; 656 Constructed Wetland;

Before Situation:
Collected liquid waste needs to be pumped to an appropriate treatment or storage facility. Waste Transfer: various types of semi-solid or liquid waste at the headquarters is uncollected causing surface and ground water issues.

After Situation:
Liquid wastes that have been collected through a waste transfer system are now efficiently transferred via pump to an appropriate treatment or storage facility.

Feature Measure: Pump Power Requirment

Scenario Unit: Horsepower

Scenario Typical Size: 1.00

Scenario Total Cost: $2,473.90

Scenario Cost/Unit: $2,473.90

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	6	$172.26
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	4	$194.40
Materials						
Pump, <= 5 HP, pump and motor, fixed cost portion	1009	Fixed cost portion of a pump less than or equal to 5 HP pump and motor. This portion is the base cost and is not dependent on horsepower. The total cost of any pump will include this fixed cost plus a variable cost portion. Includes the motor and controls for materials and shipping only.	Each	$1,659.42	1	$1,659.42
Pump, <= 5 HP, pump and motor, variable cost portion	1010	Variable cost portion of a pump less than or equal to 5 HP pump and motor. This portion is dependent on the total horsepower for the pump. The total cost of any pump will include this variable cost plus the fixed cost portion. Includes the motor and controls for materials and shipping only.	Horsepower	$447.82	1	$447.82

Practice: 533 - Pumping Plant

Scenario: #4 - Tractor Power Take Off (PTO) Manure Pump

Scenario Description:

This scenario involves a PTO driven pump to transfer semi-solid/ liquid manure (as part of a waste transfer system at the farm headquarters to a Waste Storage Facility - 313. A PTO driven pump is selected because the landowner has equipment available to supply power to the pump. Electricity is not readily available and/or a stationary engine is not a practical alternative.Resource Concerns: Water Quality degradation - Excess nutrients in surface and ground waters.Associated Practices include: 590 - Nutrient Management; 313 - Waste Storage Facility; 634 - Waste Transfer; 430 - Irrigation Pipeline; 320 - Irrigation Canal or Lateral; 378 - Pond

Before Situation:

Collected semi-solid and liquid waste needs to be pumped to an appropriate treatment or storage facility. Various types of semi-solid or liquid waste at the headquarters are uncollected causing surface and ground water resource concerns. A transfer method for waste is needed. Due to topography, gravity transfer is not possible and a properly sized pump is needed to transfer waste as part of a waste transfer system.

After Situation:

Wastes that have been collected through a waste transfer system are now efficiently transferred to an appropriate treatment or storage facility utilizing a tractor PTO driven pump.

Feature Measure: Number of Pumps

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $45,514.08

Scenario Cost/Unit: $45,514.08

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	4	$194.40
Materials						
Pump, Manure, PTO, Vertical Shaft	2159	Pump, Manure, PTO, Vertical Shaft, 6 in. discharge, HP 70 to 110 (540 RPM) or HP 125 to 140 (1000 RPM), with agitating nozzle and propeller. Includes delivery.	Each	$45,090.00	1	$45,090.00

Practice: 533 - Pumping Plant

Scenario: #5 - Pump, Manure, Solid Piston

Scenario Description:

This scenario involves a solid vertical piston pump to transfer semi-solid/ liquid or sand-laden manure (as part of a waste transfer system at the farm headquarters to a Waste Storage Facility - 313. Resource Concerns: Water Quality degradation - Excess nutrients in surface and ground waters.Associated Practices include: 590 - Nutrient Management; 313 - Waste Storage Facility; 634 - Waste Transfer;

Before Situation:

Collected semi-solid waste, and sand-laden waste needs to be pumped to an appropriate treatment or storage facility. Various types of semi-solid or liquid waste at the headquarters are uncollected causing surface and ground water resource concerns. A transfer method for waste is needed. Due to topography, gravity transfer is not possible and a properly sized pump is needed to transfer waste as part of a waste transfer system.

After Situation:

Wastes that have been collected through a waste transfer system are now efficiently transferred to an appropriate treatment or storage facility.

Feature Measure: Number of Pumps

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $40,581.98

Scenario Cost/Unit: $40,581.98

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	4	$175.48
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	10	$287.10
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	4	$194.40
Materials						
Pump, Manure, Solid Piston	2157	Pump, Manure, Solid Piston, Hydraulically Actuated, 12 in. or greater discharge, 7.5 HP w/ accessories. Includes delivery.	Each	$39,925.00	1	$39,925.00

Practice: 533 - Pumping Plant

Scenario: #7 - Tailwater Recovery - Diesel pump and sump

Scenario Description:
Large volume, low head axial flow pump to recover floodwater from cranberry harvest. Typical size is a 70 HP Internal combustion engine driven pump with a capacity of 13,000 gallons per minute. Resource Concern is excess nutrients and pesticides in surface water and inefficient use of irrigation water. Associated Practices; 430-Irrigation Pipeline

Before Situation:
Floodwater containing excess nutrients are discharged to surface water

After Situation:
Floodwater is captured and returned to a water supply reservoir for later reuse for irrigation or harvest flooding. This scenario includes 50 ft of pipe to collect the flood water for recovery and reuse operations.

Feature Measure: pumping power Requirement

Scenario Unit: Horsepower

Scenario Typical Size: 70.00

Scenario Total Cost: $66,604.40

Scenario Cost/Unit: $951.49

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	2	$1,134.16
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	4	$522.04
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	24	$689.04
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	4	$160.52
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	24	$1,166.40
Materials						
Pump, > 50 to 70 HP, Pump & ICE power unit	1028	Materials, labor, controls: > 50 to 70 HP Pump & ICE power unit	Horsepower	$658.37	70	$46,085.90
Manhole, 6 ft x 10 ft	2107	Precast Manhole with base and top delivered. 6 feet diameter x 10 feet depth. Materials, equipment and labor included.	Each	$8,079.63	1	$8,079.63
Pipe, Steel, Std Wt., Used, weight priced	2870	Schedule 40 steel pipe, used. Materials only.	Pound	$0.96	8335.5	$8,002.08
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 533 - Pumping Plant

Scenario: #8 - Tailwater Recovery, PTO pump and sump

Scenario Description:
Large volume, low head axial flow pump to recover floodwater from cranberry harvest. Typical size is a PTO driven pump with a capacity of 13,000 gallons per minute. Resource Concern is excess nutrients and pesticides in surface water and inefficient use of irrigation water. Associated Practices; 430- Irrigation Pipeline

Before Situation:
Floodwater containing excess nutrients are discharged to surface water

After Situation:
Floodwater is captured and returned to a water supply reservoir for later reuse for irrigation or harvest flooding. This scenario includes 50 ft of pipe to collect the flood water for recovery and reuse operations.

Feature Measure: Pumping Capacity of PTO pump

Scenario Unit: Gallons per Minute

Scenario Typical Size: 13,000.00

Scenario Total Cost: $59,258.50

Scenario Cost/Unit: $4.56

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	2	$1,134.16
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	4	$522.04
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	24	$689.04
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	4	$160.52
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	24	$1,166.40
Materials						
Manhole, 6 ft x 10 ft	2107	Precast Manhole with base and top delivered. 6 feet diameter x 10 feet depth. Materials, equipment and labor included.	Each	$8,079.63	1	$8,079.63
Pump, 40-80 hp axial flow/mixed flow	2215	Propeller pump to handle 10,000 - 20,000gpm axial flow/ mixed flow; 12 in. - 24 in. discharge, head (<20' to 25'), propeller type pump. Materials and shipping only.	Gallons per Minute	$2.98	13000	$38,740.00
Pipe, Steel, Std Wt., Used, weight priced	2870	Schedule 40 steel pipe, used. Materials only.	Pound	$0.96	8335.5	$8,002.08
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 533 - Pumping Plant

Scenario: #9 - Tailwater Recovery, Electric

Scenario Description:
Large volume, low head axial flow pump to recover floodwater from cranberry harvest. Typical size is a 50 HP electric motor driven pump with a capacity of 13,000 gallons per minute. Resource Concern is excess nutrients and pesticides in surface water and inefficient use of irrigation water. Associated Practices; 430- Irrigation Pipeline

Before Situation:
Floodwater containing excess nutrients are discharged to surface water

After Situation:
Floodwater is captured and returned to a water supply reservoir for later reuse for irrigation or harvest flooding. This scenario includes 50 ft of pipe to collect the flood water for recovery and reuse operations.

Feature Measure: Pumping Power Requirement

Scenario Unit: Horsepower

Scenario Typical Size: 50.00

Scenario Total Cost: $39,932.17

Scenario Cost/Unit: $798.64

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	2	$1,134.16
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	4	$522.04
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	24	$689.04
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	4	$160.52
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	24	$1,166.40
Materials						
Pump, > 30 HP, pump and motor, fixed cost portion	1013	Fixed cost portion of a pump greater than 30 HP, including the pump and motor. This portion is a base cost for the pump and is not dependent on horsepower. The total cost will include this fixed cost plus a variable cost portion. Includes material and shipping only.	Each	$6,467.67	1	$6,467.67
Pump, >30 HP, Pump and motor, variable cost portion	1014	Variable cost portion of a pump greater than 30 HP, including the pump and motor. This portion is dependent on the total horsepower for the pump. The total cost will include this variable cost plus a fixed cost portion. Includes material and shipping only.	Horsepower	$258.92	50	$12,946.00
Manhole, 6 ft x 10 ft	2107	Precast Manhole with base and top delivered. 6 feet diameter x 10 feet depth. Materials, equipment and labor included.	Each	$8,079.63	1	$8,079.63
Pipe, Steel, Std Wt., Used, weight priced	2870	Schedule 40 steel pipe, used. Materials only.	Pound	$0.96	8335.5	$8,002.08
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 533 - Pumping Plant

Scenario: #10 - Electric-Powered Pump less than or equal to 3 HP with Pressure Tank

Scenario Description:

A 1 Hp submersible electric-powered pump is installed in a well or structure; or a close-coupled 1 Hp electric-powered centrifugal pump is mounted on a platform. It is used for watering livestock as part of a prescribed grazing system; or for pressurizing a small irrigation system. Resource Concerns: Livestock Production Limitation - Inadequate livestock water; Insufficient water - Inefficient use of irrigation water.Associated Practices include: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 449 - Irrigation Water Management; 516 - Livestock Pipeline.

Before Situation:

Livestock: The present gravity flow system is inadequate to provide the proper flow rate for a prescribed grazing system. Irrigation: Available water is at an insufficient pressure to allow for even distribution of water.

After Situation:

Livestock: Water is transferred at a sufficient rate and pressure to meet the requirements of a prescribed grazing system. Irrigation: A properly designed pump is installed to improve irrigation efficiency and reduce energy usage.

Feature Measure: Pump Power Requirement

Scenario Unit: Horsepower

Scenario Typical Size: 1.00

Scenario Total Cost: $4,042.75

Scenario Cost/Unit: $4,042.75

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	0.25	$125.31
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	4	$101.44
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	8	$350.96
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	14	$401.94
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	4	$194.40
Materials						
Pump, <= 5 HP, pump and motor, fixed cost portion	1009	Fixed cost portion of a pump less than or equal to 5 HP pump and motor. This portion is the base cost and is not dependent on horsepower. The total cost of any pump will include this fixed cost plus a variable cost portion. Includes the motor and controls for materials and shipping only.	Each	$1,659.42	1	$1,659.42
Pump, <= 5 HP, pump and motor, variable cost portion	1010	Variable cost portion of a pump less than or equal to 5 HP pump and motor. This portion is dependent on the total horsepower for the pump. The total cost of any pump will include this variable cost plus the fixed cost portion. Includes the motor and controls for materials and shipping only.	Horsepower	$447.82	1	$447.82
Pressure Tank, 40 gallon	1038	Pressure Tank, 40 gallon. Includes materials and shipping only.	Each	$428.69	1	$428.69
Wire, Submersible pump, 8/3	2775	Heavy duty 8/3 submersible pump wire suitable for 3 wire submersible pumps with ground wire. Includes material and shipping only.	Feet	$3.11	107	$332.77

Practice: 533 - Pumping Plant

Scenario: #11 - Electric-Powered Pump between 3 and 10 HP

Scenario Description:

This is a close-coupled 6.5 Hp electric-powered centrifugal pump, mounted on a platform. It is for a large, high-pressure (200 psi) livestock pipeline, used for watering livestock as part of a prescribed grazing system; or for pressurizing a medium-sized (200 gpm and 40 psi) irrigation system; or a medium-sized (400 gpm and 20 psi) waste transfer system. Resource Concerns: Livestock Production Limitation - Inadequate livestock water; Water Quality degradation - Excess nutrients in surface and ground waters; Insufficient water - Inefficient use of irrigation water.Associated Practices include: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 449 - Irrigation Water Management; 516 - Livestock Pipeline; 313 - Waste Storage Facility; 634 - Waste Transfer; and 614 - Watering Facility.

Before Situation:

Livestock: Current system consists of a series of medium pressure and inefficient pump stations to transport water to a distant and higher-elevation watering facility. Irrigation: An existing irrigation system employs an inefficient, improperly sized pump, that prevents efficient water application resulting in water loss and high energy use. Waste Transfer: Various types of semi-solid or liquid waste are uncollected causing surface and ground water issues. Due to topography, gravity transfer is not possible and a properly sized pump is needed to transfer waste as part of a waste transfer system.

After Situation:

Livestock: A single, efficient, high-pressure pumping plant is installed, eliminating intermediate pump stations, reducing energy use and enabling better system management. Irrigation: A properly designed and efficient pumping plant is installed, reducing energy use and improving irrigation efficiency. Waste Transfer: Collected wastes are now efficiently transferred to an appropriate treatment or storage facility.

Feature Measure: Pump Power Requirement

Scenario Unit: Horsepower

Scenario Typical Size: 6.50

Scenario Total Cost: $7,643.71

Scenario Cost/Unit: $1,175.96

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	0.5	$250.63
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	4	$101.44
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	8	$350.96
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	16	$459.36
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	16	$777.60
Materials						
Pump, > 5 HP to 30 HP, pump and motor, fixed cost portion	1011	Fixed cost portion of a pump between 5 and 30 HP, including the pump and motor. This portion is a base cost for the pump and is not dependent on horsepower. The total cost will include this fixed cost plus a variable cost portion. Includes material and shipping only.	Each	$3,727.95	1	$3,727.95
Pump, > 5 HP to 30 HP, pump and motor, variable cost portion	1012	Variable cost portion of a pump between 5 and 30 HP, including the pump and motor. This portion is dependent on the total horsepower for the pump. The total cost will include this variable cost plus a fixed cost portion. Includes material and shipping only.	Horsepower	$252.77	6.5	$1,643.01
Wire, Submersible pump, 8/3	2775	Heavy duty 8/3 submersible pump wire suitable for 3 wire submersible pumps with ground wire. Includes material and shipping only.	Feet	$3.11	107	$332.77

Practice: 533 - Pumping Plant

Scenario: #12 - Electric-Powered Pump between 10 and 40 HP

Scenario Description:

This is a close-coupled, 3-phase, 25 Hp electric-powered centrifugal pump mounted on a platform for pressurizing a medium-sized (600 gpm and 50 psi) sprinkler or large microirrigation (850 gpm and 35 psi) system or a large-sized surface irrigaiton system (1,200 gpm) or a large-sized (1,200 gpm and 25 psi) waste transfer system. Resource Concerns: Water Quality degradation - Excess nutrients in surface and ground waters; Insufficient water - Inefficient use of irrigation water.Associated Practices include: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 449 - Irrigation Water Management; 313 - Waste Storage Facility; 634 - Waste Transfer; and 614 - Watering Facility.

Before Situation:

Irrigation: An existing irrigation system employs an inefficient, improperly sized pump that prevents efficient water application resulting in water loss and high energy use. Waste Transfer: Various types of semi-solid or liquid waste are uncollected causing surface and ground water issues. Due to topography, gravity transfer is not possible and a properly sized pump is needed to transfer waste as part of a waste transfer system.

After Situation:

Irrigation: A properly designed and efficient pumping plant is installed, reducing energy use and improving irrigation efficiency. Waste Transfer: Collected wastes are now efficiently transferred to an appropriate treatment or storage facility or to a distribution system.

Feature Measure: Pump Power Requirement

Scenario Unit: Horsepower

Scenario Typical Size: 25.00

Scenario Total Cost: $14,686.94

Scenario Cost/Unit: $587.48

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	2	$1,002.50
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	8	$529.44
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	4	$101.44
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	8	$350.96
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	16	$459.36
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	8	$321.04
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	16	$777.60
Materials						
Pump, > 5 HP to 30 HP, pump and motor, fixed cost portion	1011	Fixed cost portion of a pump between 5 and 30 HP, including the pump and motor. This portion is a base cost for the pump and is not dependent on horsepower. The total cost will include this fixed cost plus a variable cost portion. Includes material and shipping only.	Each	$3,727.95	1	$3,727.95
Pump, > 5 HP to 30 HP, pump and motor, variable cost portion	1012	Variable cost portion of a pump between 5 and 30 HP, including the pump and motor. This portion is dependent on the total horsepower for the pump. The total cost will include this variable cost plus a fixed cost portion. Includes material and shipping only.	Horsepower	$252.77	25	$6,319.25
Wire, Submersible pump, 8/3	2775	Heavy duty 8/3 submersible pump wire suitable for 3 wire submersible pumps with ground wire. Includes material and shipping only.	Feet	$3.11	107	$332.77
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 533 - Pumping Plant

Scenario: #13 - Electric-Powered Pump greater than 40 HP

Scenario Description:

This is a close-coupled, 3-phase, 50 Hp electric-powered centrifugal pump mounted on a platform for pressurizing a large-sized (1,200 gpm and 50 psi) sprinkler or very large microirrigation (1,700 gpm and 35 psi) system or a very large-sized surface irrigation system (2,800 gpm) or a very large-sized (2,400 gpm and 25 psi) waste transfer system. Resource Concerns: Water Quality degradation - Excess nutrients in surface and ground waters; Insufficient water - Inefficient use of irrigation water.Associated Practices include: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 449 - Irrigation Water Management; 313 - Waste Storage Facility; and 634 - Waste Transfer.

Before Situation:

Irrigation: An existing irrigation system employs an inefficient, improperly sized pump that prevents efficient water application resulting in water loss and high energy use.

After Situation:

Irrigation: A properly designed and efficient pumping plant is installed, reducing energy use and improving irrigation efficiency.

Feature Measure: Pump Power Requirement

Scenario Unit: Horsepower

Scenario Typical Size: 50.00

Scenario Total Cost: $24,053.41

Scenario Cost/Unit: $481.07

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	2	$1,002.50
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	8	$529.44
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	4	$101.44
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	8	$350.96
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	16	$459.36
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	8	$321.04
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	16	$777.60
Materials						
Pump, > 30 HP, pump and motor, fixed cost portion	1013	Fixed cost portion of a pump greater than 30 HP, including the pump and motor. This portion is a base cost for the pump and is not dependent on horsepower. The total cost will include this fixed cost plus a variable cost portion. Includes material and shipping only.	Each	$6,467.67	1	$6,467.67
Pump, >30 HP, Pump and motor, variable cost portion	1014	Variable cost portion of a pump greater than 30 HP, including the pump and motor. This portion is dependent on the total horsepower for the pump. The total cost will include this variable cost plus a fixed cost portion. Includes material and shipping only.	Horsepower	$258.92	50	$12,946.00
Wire, Submersible pump, 8/3	2775	Heavy duty 8/3 submersible pump wire suitable for 3 wire submersible pumps with ground wire. Includes material and shipping only.	Feet	$3.11	107	$332.77
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 533 - Pumping Plant

Scenario: #14 - Variable Frequency Drive (LSR)

Scenario Description:

This is an installation of electrical and electronic components designed to vary the frequency of the voltage to an electric motor and thus the ability to vary the speed of the motor. This directly affects pressure and flowrate. This also could give the operator the flexibility to operate several systems separately or at the same time.Resource concerns: Insufficient water - Inefficient use of irrigation water; Inefficient energy use - Equipment and facilities and Farming/ranching practices and field operations.Associated Practices: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 449 - Irrigation Water Management; 516 - Livestock Pipeline; and 614 - Watering Facility.

Before Situation:

Standard electrical connection from electrical utility to pump motor. No capability to match pump output pressure and/or flowrate to field(s) need(s). Result is over/under pressure(s) and/or flow rate(s), possible hydraulic anomalies, energy loss, and or inefficient water application in the irrigation system.

After Situation:

VFD Modifications are implemented at the pump site to allow for varying the speed of a 40 Hp electric motor to match the pressure and flow requirements for a center pivot irrigation system.

Feature Measure: Pump Power Requirement

Scenario Unit: Horsepower

Scenario Typical Size: 50.00

Scenario Total Cost: $6,737.98

Scenario Cost/Unit: $134.76

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	6	$263.22
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	6	$172.26
Materials						
Variable Speed Drive, 50 HP	1288	Variable speed drive for 50 Horsepower electric motor. Does not include motor. Materials only.	Horsepower	$126.05	50	$6,302.50

Practice: 533 - Pumping Plant

Scenario: #18 - Windmill-Powered Pump

Scenario Description:

A windmill is installed in order to supply a reliable water source for livestock and/or wildlife. The windmill includes the tower, concrete footings, wheel blade unit, sucker rod, down pipe, gear box, pump, plumbing, and well head protection concrete pad. The typical scenario will be a windmill system with a 10 ft diameter mill and 27-foot tower which is pumping from a 150-foot well. As a result of installing this windmill, resource concerns of inadequate stock water, plant establishment, growth, productivity, health, and vigor, and water quantity can be addressed.Resource Concerns: Insufficient stockwater.

Before Situation:

In a rangeland or pasture setting, a reliable source of water for livestock is not available, or the spacing between water sources is such that grazing distribution and plant health are adversely impacted.

After Situation:

A windmill, with a wheel ranging from 6' to 16' in diameter, will be installed over a well that is located to provide a reliable source of livestock water at the rate of at least 2 gpm, to facilitate proper grazing distribution and improved plant health. To increase reliability, water is pumped into a storage tank to provide a given number of days of supply. Installation includes the footings, wellhead protection concrete pad, tower, gear box, sail, sucker rod, down hole accessories, and a short outlet pipe to a storage tank.

Feature Measure: Diameter of Mill Wheel

Scenario Unit: Feet

Scenario Typical Size: 10.00

Scenario Total Cost: $13,613.38

Scenario Cost/Unit: $1,361.34

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	2	$1,002.50
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	4	$101.44
Aerial lift, telescoping bucket	1893	Aerial lift, bucket truck or cherry picker, typical 40' boom. Equipment only.	Hours	$45.71	8	$365.68
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	32	$918.72
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	16	$777.60
Materials						
Windmill, 10 ft. fan diameter	1036	Includes materials costs for windmill head and 27 foot tower	Each	$8,918.18	1	$8,918.18
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 533 - Pumping Plant

Scenario: #19 - Photovoltaic-Powered Pump

Scenario Description:

The typical scenario assumes installation of a submersible solar-powered pump in a well or a live stream. The installation includes the pump, wiring, drop pipe, solar panels, mounts, inverter, and all appurtenances. Note: It is generally not advisable to use a storage battery for a number of reasons. A storage tank is generally the most efficient method to store energy. Grazing - Livestock exclusion from surface water will result in improved surface water quality and reduced erosion. Irrigation - energy consumption will be reduced and the increased pressure and flow rates will improve irrigation efficiency.Resource Concerns: Insufficient stockwater.Associated Practices include: 374 - Farmstead Energy Improvement; 382 - Fence; 430 - Irrigation Pipeline; 436 - Irrigation Reservoir; 516 - Livestock Pipeline; 561 - Heavy Use Area Protection; and, 614 - Watering Facility.

Before Situation:

Livestock: Inadequate supply or location of water for a prescribed grazing system. Eroded stream banks and degraded water quality due to livestock access to stream. Cattle are not well-distributed because of remote water location. Irrigation: Pressure and flow rate is insufficient for uniform irrigation.

After Situation:

The typical scenario assumes installation of a 230-watt photovoltaic (PV) panel, capable of operating a 1/2 Hp (0.5 Hp) solar-powered submersible pump in a well or other water source (Notes: 1) A PV panel is rated under standard and ideal conditions which will most likely not be replicated in the field; 2) 1 Hp is defined as 746 watts; 3) It is reasonable to expect a 1/2 Hp solar-powered submersible pump to deliver about 2 gpm and develop a pressure at the pump outlet of about 60 psi.). The installation includes the pump, wiring, pipeline in the well, solar panels, frame mounts, inverter, and all appurtenances. Water will be pumped to an existing storage tank at a higher elevation from which it will be used to pressurize the Livestock Pipeline (516) or Irrigation Pipeline (430). Grazing - Livestock exclusion from surface water will result in improved surface water quality and reduced erosion. Grazing has potential to be well distributed. Irrigation: Improved pressure and flow rate will improve irrigation efficiency.

Feature Measure: Horsepower of Pump

Scenario Unit: Horsepower

Scenario Typical Size: 0.50

Scenario Total Cost: $9,039.47

Scenario Cost/Unit: $18,078.94

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	8	$202.88
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	6	$263.22
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	16	$459.36
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	8	$388.80
Materials						
Solar Pumping System, Fixed Cost Portion	2495	Fixed cost portion of a solar powered pumping system. This portion is a base cost for a complete system including the photovoltaic panels, pumping plant, support braces, electric controllers, service drop, etc., and is not dependant on KiloWatt. The total cost will include this fixed cost plus a variable cost portion. Includes the cost of materials only.	Each	$3,392.29	1	$3,392.29
Solar Pumping System, Variable Cost Portion	2496	Variable cost portion of a solar powered pumping system. This portion IS dependent upon the total kilowatts of the photovoltaic panels, but also includes the pumping plant, support braces, electric controllers, service drop, etc. The total cost will include this variable cost plus a fixed cost portion. Includes the cost of materials only.	Kilowatt	$3,832.92	1	$3,832.92
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	500	$500.00

Practice: 533 - Pumping Plant

Scenario: #20 - Silage Leachate and Runoff Pump Controller

Scenario Description:

Pump Controls are needed to enable a pump to collect all silage leachate and a portion of first flush runoff to a storage or treatment facility Resource Concerns: Water Quality degradation - Excess nutrients in surface and ground waters.Associated Practices include: 590 - Nutrient Management; 313 - Waste Storage Facility; 634 - Waste Transfer;

Before Situation:

Silage leachate and runoff leave are impacting surface or ground water resources

After Situation:

Waste Transfer: Liquid wastes that have been collected through a waste transfer system are now efficiently transferred to an appropriate treatment or storage facility.

Feature Measure: Controller installation

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $4,469.66

Scenario Cost/Unit: $4,469.66

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	4	$175.48
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	4	$194.40
Materials						
Effluent pump appertenances	2162	Controller for pump system with timer, event counter and run time meter, 3 float switch assembly and alarm system with electrical connections.	Each	$4,099.78	1	$4,099.78

Practice: 533 - Pumping Plant

Scenario: #21 - Livestock Nose Pump or Ram Pump

Scenario Description:

A Nose Pump is a diaphragm pump located in a pasture for the purpose of providing water to cattle. For a permanent installation, it is typical to also install Heavy Use Area Protection (561) (separate contract item) where the cattle congregate around the pump. It is powered and operated by cattle to transfer water from a stream to a drinking bowl. The objective is to provide water to the cattle outside of a live stream or other natural water source thereby eliminating a significant erosion situation and while also improving water quality. The cattle thus have access to drinking water without having to enter the stream. Generally one nose pump is adequate for 20 cattle. A water ram is used to transfer water from a live stream to a Watering Facility (614) utilizing the energy of moving water to transfer a portion of that water to a higher elevation. It is anchored to a small concrete pad. Bypass water (which could easily be 90% of the water diverted from the stream) is returned to the stream or transferred in a pipe, to a lower elevation tank (614), without erosion or impairment to water quality. The cattle thus have access to drinking water without having to enter the stream. Resource Concerns: Insufficient stockwater; Inefficient energy use - Equipment and facilities.Associated Practices include: 374 - Farmstead Energy Improvement; 382 - Fence; 516 - Livestock Pipeline; 561 - Heavy Use Area Protection; and, 614 - Watering Facility.

Before Situation:

Livestock have open access to a live stream or other existing natural water supply. Water supply is contaminated due to animal activity and stream banks are eroded on a daily basis. Improper cattle distribution results in poor water quality, poor grazing distribution, over grazing, and soil erosion.

After Situation:

One nose pump is installed with all appurtenances anchored to concrete pad with steel reinforcement (9 ft x 4 ft x 6 in) or other appropriate secure base to supply water to cattle for improved livestock herd management. Additional Heavy Use Area Protection (561) in the form of crushed rock and at least 5 feet wide, may be installed (separate contract item) surrounding the concrete pad. Improved: water quality, soil quality, grazing management, plant diversity, and animal health.

Feature Measure: Number of Pumps

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $2,686.47

Scenario Cost/Unit: $2,686.47

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	0.7	$350.88
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	4	$264.72
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	4	$101.44
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	4	$160.52
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	8	$388.80
Materials						
Nose Pump	1052	Materials and delivery.	Each	$425.80	1	$425.80
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 533 - Pumping Plant

Scenario: #80 - Electric-Powered Pump less than or equal to 3 HP wthout Pressure Tank

Scenario Description:

A 1 Hp submersible electric-powered pump is installed in a well or structure; or a close-coupled 1 Hp electric-powered centrifugal pump is mounted on a platform. It is used for watering livestock as part of a prescribed grazing system; or for pressurizing a smal irrigation system. Resource Concerns: Livestock Production Limitation - Inadequate livestock water; Insufficient water - Inefficient use of irrigation water. Associated Practices include: 374- Farmstead Energy Improvement; 43 0 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 449 - Irrigation Water Management; 51 6 - Livestock Pipeline.

Before Situation:

The present gravity flow system is inadequate to provide the proper flow rate for a prescribed grazing system. Irrigation: An existing irrigation system employs an inefficient, improperly sized pump that prevents efficient water application resulting in water loss and high energy use.

After Situation:

Water is transferred at a sufficient rate and pressure to meet the requirements of a prescribed grazing system. Irrigation: A properly designed pump is installed to improve irrigation efficiency and reduce energy usage.

Feature Measure: Pump power requirement

Scenario Unit: Horsepower

Scenario Typical Size: 1.00

Scenario Total Cost: $3,614.06

Scenario Cost/Unit: $3,614.06

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	0.25	$125.31
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	4	$101.44
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	8	$350.96
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	14	$401.94
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	4	$194.40
Materials						
Pump, <= 5 HP, pump and motor, fixed cost portion	1009	Fixed cost portion of a pump less than or equal to 5 HP pump and motor. This portion is the base cost and is not dependent on horsepower. The total cost of any pump will include this fixed cost plus a variable cost portion. Includes the motor and controls for materials and shipping only.	Each	$1,659.42	1	$1,659.42
Pump, <= 5 HP, pump and motor, variable cost portion	1010	Variable cost portion of a pump less than or equal to 5 HP pump and motor. This portion is dependent on the total horsepower for the pump. The total cost of any pump will include this variable cost plus the fixed cost portion. Includes the motor and controls for materials and shipping only.	Horsepower	$447.82	1	$447.82
Wire, Submersible pump, 8/3	2775	Heavy duty 8/3 submersible pump wire suitable for 3 wire submersible pumps with ground wire. Includes material and shipping only.	Feet	$3.11	107	$332.77

Practice: 533 - Pumping Plant

Scenario: #81 - Irrigation pump modification

Scenario Description:

This scenario includes the modification and/or replacement of vertical turbine pumps in conjunction with an irrigation conversion practice to ensure energy and water savings are realized. This includes an inventory or evaluation of existing pump performance data. This scenario includes all materials, equipment and labor to test and repair the inner column of the pump assembly and re-owling. Resource Concerns: Water Quality degradation - Excess nutrients in surface and ground waters; Insufficient water - Inefficient use of irrigation water. Associated Practices include: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Micro-irigation; 449 - Irrigation Water Management; 313 - Waste Storage Facility; 634 - Waste Transfer; 436 - Irrigation Reservoir; and 447 - Irrigation System, Tailwater Recovery; and 614 - Watering Facility.

Before Situation:

160 acres of cropland is being irrigated with a less efficient system than a properly designed low pressure center pivot or linear move system.

After Situation:

Irrigation system on 160 acres of cropland has been converted to use a more efficient method of irrigation. The new pump and irrigation delivery are designed as a system that maximizes efficiency in energy and water use.

Feature Measure: Number of pumps modified

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $19,235.95

Scenario Cost/Unit: $19,235.95

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	16	$405.76
Aerial lift, telescoping bucket	1893	Aerial lift, bucket truck or cherry picker, typical 40' boom. Equipment only.	Hours	$45.71	16	$731.36
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	32	$918.72
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	16	$777.60
Materials						
Pump, Bowl replacement, 30 to 100 HP	1984	Includes all material and shop labor to replace/service the entire set of bowls for a vertical turbine pump, install new bowls as necessary, and all appurtenances and materials to connect to the existing well column. Typical of 100 to 300 feet of column depth, 400 to 800 gpm discharge at 30 to 50 psi.?? ??Does not include labor and equipment to remove and install the assembled pump from the well.	Horsepower	$198.31	75	$14,873.25
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 533 - Pumping Plant

Scenario: #82 - Pump Replacement greater than 40 HP

Scenario Description:
This is a 50 Hp centrifugal pump mounted on a platform for pressurizing a large-sized (1,200 gpm and 50 psi) sprinkler or very large microirrigation (1,700 gpm and 35 psi) system or a very large-sized surface irrigation system (2,800 gpm) or a very large-sized (2,400 gpm and 25 psi) waste transfer system. Resource Concerns: Water Quality degradation - Excess nutrients in surface and ground waters; Insufficient water - Inefficient use of irrigation water. Associated Practices include: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 449 - Irrigation Water Management; 313 - Waste Storage Facility; and 634 - Waste Transfer.

Before Situation:
An existing irrigation system employs an inefficient, improperly sized pump that prevents efficient water application resulting in water loss and high energy use.

After Situation:
A properly designed and efficient pumping plant is installed, reducing energy use and improving irrigation efficiency.

Feature Measure: Pump Power Required

Scenario Unit: Horsepower

Scenario Typical Size: 50.00

Scenario Total Cost: $26,018.01

Scenario Cost/Unit: $520.36

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	8	$529.44
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	4	$101.44
Pump, Turbine, Cast Iron, fixed cost portion	2148	Fixed cost portion of cast iron turbine pump with appurtenances. Includes pump, appurtenances, and labor to install.	Each	$14,029.28	1	$14,029.28
Pump, Turbine, Cast Iron, variable cost portion	2149	Variable cost portion of cast iron turbine pump with appurtenances. Includes pump, appurtenances, and labor to install.	Gallons per Minute	$7.31	1200	$8,772.00
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	6	$263.22
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	16	$459.36
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	8	$321.04
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	16	$777.60
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 533 - Pumping Plant

Scenario: #83 - Pump House

Scenario Description:
Installation of an above ground pump house of whatever size is required for the installation in order to provide satisfactory weather proofing of critical system components.

Before Situation:
Pump controllers, pressure tanks, and other components are exposed to the weather and elements and fail to provide adequate life span.

After Situation:
An above ground weather proof enclosure is available to protect pressure tank, pump controllers, and other system appurtenances in order to ensure they provide satisfactory service life.

Feature Measure: Each Pump House Installed

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $1,247.86

Scenario Cost/Unit: $1,247.86

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Materials						
Pump House, Above Ground	2470	Above ground prefabricated pump house. Includes material and shipping only.	Each	$1,018.18	1	$1,018.18

Practice: 533 - Pumping Plant

Scenario: #96 - Variable Frequency Drive, 15HP or Less

Scenario Description:

This is an installation of electrical and electronic components designed to vary the frequency of the voltage to an electric motor and thus the ability to vary the speed of the motor. This directly affects pressure and flowrate. This also could give the operator the flexibility to operate several systems separately or at the same time. Resource concerns: Insufficient water - Inefficient use of water; Inefficient energy use - Equipment and facilities and Farming/ranching practices and field operations. Associated Practices: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 449 - Irrigation Water Management; 516 - Livestock Pipeline; and 614 - Watering Facility, 634-Waste Transfer.

Before Situation:

Standard electrical connection from electrical utility to pump motor. No capability to match pump output pressure and/or flowrate to field(s), or livestock need(s). Result is over/under pressure(s) and/or flow rate(s), possible hydraulic anomalies, energy loss, and or inefficient water use.

After Situation:

VFD or VFD modifications are implemented at the pump site to allow for varying the speed of a 15 Hp electric motor or less to match the pressure and flow requirements for a pumping system.

Feature Measure: Each VSD or VFD Installed

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $3,005.81

Scenario Cost/Unit: $3,005.81

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	8	$350.96
Materials						
Variable Speed Drive, 10 HP	1287	Variable speed drive for 10 Horsepower electric motor. Does not include motor. Materials only.	Horsepower	$176.99	15	$2,654.85

Practice: 533 - Pumping Plant

Scenario: #207 - Electric-Powered Pump <= 5 Hp

Scenario Description:

A 1 Hp submersible electric-powered pump is installed in a well or structure; or a close-coupled 1 Hp electric-powered centrifugal pump is mounted on a platform. It is used for watering livestock as part of a prescribed grazing system; or for pressurizing a small irrigation system; or for transferring liquid waste in a waste transfer system.

Resource Concerns: Livestock Production Limitation - Inadequate livestock water; Water Quality degradation - Excess nutrients in surface and ground waters; Insufficient water - Inefficient use of irrigation water.Associated Practices include: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 449 - Irrigation Water Management; 516 - Livestock Pipeline; 313 - Waste Storage Facility; 634 - Waste Transfer; and 614 - Watering Facility.

Before Situation:

Livestock: The present gravity flow system is inadequate to provide the proper flow rate for a prescribed grazing system. Irrigation: Available water is at an insufficient pressure to allow for even distribution of water.Waste Transfer: Contaminated water needs to be moved to a containment facility.

After Situation:

Livestock: Water is transferred at a sufficient rate and pressure to meet the requirements of a prescribed grazing system. Irrigation: A properly designed pump is installed to improve irrigation efficiency and reduce energy usage. Waste Transfer: Liquid wastes that have been collected through a waste transfer system are now efficiently transferred to an appropriate treatment or storage facility.

Feature Measure: Pump Power Requirement

Scenario Unit: Brake Horse Power

Scenario Typical Size: 2.50

Scenario Total Cost: $3,794.80

Scenario Cost/Unit: $1,517.92

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	1	$501.25
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	2	$50.72
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	6	$172.26
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	6	$291.60
Materials						
Pump, <= 5 HP, pump and motor, fixed cost portion	1009	Fixed cost portion of a pump less than or equal to 5 HP pump and motor. This portion is the base cost and is not dependent on horsepower. The total cost of any pump will include this fixed cost plus a variable cost portion. Includes the motor and controls for materials and shipping only.	Each	$1,659.42	1	$1,659.42
Pump, <= 5 HP, pump and motor, variable cost portion	1010	Variable cost portion of a pump less than or equal to 5 HP pump and motor. This portion is dependent on the total horsepower for the pump. The total cost of any pump will include this variable cost plus the fixed cost portion. Includes the motor and controls for materials and shipping only.	Horsepower	$447.82	2.5	$1,119.55

Practice: 533 - Pumping Plant

Scenario: #208 - Electric-Powered Pump <= 5 HP with Pressure Tank

Scenario Description:

A 1 Hp submersible electric-powered pump is installed in a well or structure; or a close-coupled 1 Hp electric-powered centrifugal pump is mounted on a platform. It is used for watering livestock as part of a prescribed grazing system; or for pressurizing a small irrigation system. Resource Concerns: Livestock Production Limitation - Inadequate livestock water; Insufficient water - Inefficient use of irrigation water.Associated Practices include: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 449 - Irrigation Water Management; 516 - Livestock Pipeline.

Before Situation:

Livestock: The present gravity flow system is inadequate to provide the proper flow rate for a prescribed grazing system. Irrigation: Available water is at an insufficient pressure to allow for even distribution of water.

After Situation:

Livestock: Water is transferred at a sufficient rate and pressure to meet the requirements of a prescribed grazing system. Irrigation: A properly designed pump is installed to improve irrigation efficiency and reduce energy usage.

Feature Measure: Pump Power Requirement

Scenario Unit: Brake Horse Power

Scenario Typical Size: 1.00

Scenario Total Cost: $3,175.82

Scenario Cost/Unit: $3,175.82

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	0.25	$125.31
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	2	$50.72
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	6	$172.26
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	6	$291.60
Materials						
Pump, <= 5 HP, pump and motor, fixed cost portion	1009	Fixed cost portion of a pump less than or equal to 5 HP pump and motor. This portion is the base cost and is not dependent on horsepower. The total cost of any pump will include this fixed cost plus a variable cost portion. Includes the motor and controls for materials and shipping only.	Each	$1,659.42	1	$1,659.42
Pump, <= 5 HP, pump and motor, variable cost portion	1010	Variable cost portion of a pump less than or equal to 5 HP pump and motor. This portion is dependent on the total horsepower for the pump. The total cost of any pump will include this variable cost plus the fixed cost portion. Includes the motor and controls for materials and shipping only.	Horsepower	$447.82	1	$447.82
Pressure Tank, 40 gallon	1038	Pressure Tank, 40 gallon. Includes materials and shipping only.	Each	$428.69	1	$428.69

Practice: 533 - Pumping Plant

Scenario: #209 - Electric-Powered Pump >5 HP<=30 hp

Scenario Description:

This is a close-coupled, 3-phase, 20 Hp electric-powered centrifugal pump mounted on a platform for pressurizing a medium-sized (500 gpm and 50 psi) sprinkler or large microirrigation (1,000 gpm and 30 psi) system or a large-sized surface irrigation system (1,500 gpm) or a medium-sized (1,000 gpm and 25 psi) waste transfer system.

Resource Concerns: Water Quality degradation - Excess nutrients in surface and ground waters; Insufficient water - Inefficient use of irrigation water.Associated Practices include: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 449 - Irrigation Water Management; 313 - Waste Storage Facility; and 634 - Waste Transfer.

Before Situation:

Irrigation: An existing irrigation system employs an inefficient, improperly sized pump that prevents efficient water application resulting in water loss and high energy use.

After Situation:

Irrigation: A properly designed and efficient pumping plant is installed, reducing energy use and improving irrigation efficiency.

Feature Measure: Pump Power Requirement

Scenario Unit: Brake Horse Power

Scenario Typical Size: 20.00

Scenario Total Cost: $18,266.07

Scenario Cost/Unit: $913.30

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	2	$1,002.50
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	8	$529.44
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	56	$1,420.16
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	8	$350.96
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	56	$1,607.76
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	8	$321.04
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	56	$2,721.60
Materials						
Pump, > 5 HP to 30 HP, pump and motor, fixed cost portion	1011	Fixed cost portion of a pump between 5 and 30 HP, including the pump and motor. This portion is a base cost for the pump and is not dependent on horsepower. The total cost will include this fixed cost plus a variable cost portion. Includes material and shipping only.	Each	$3,727.95	1	$3,727.95
Pump, > 5 HP to 30 HP, pump and motor, variable cost portion	1012	Variable cost portion of a pump between 5 and 30 HP, including the pump and motor. This portion is dependent on the total horsepower for the pump. The total cost will include this variable cost plus a fixed cost portion. Includes material and shipping only.	Horsepower	$252.77	20	$5,055.40
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 533 - Pumping Plant

Scenario: #210 - Electric-Powered Pump >30 hp <=75

Scenario Description:

This is a close-coupled, 3-phase, 50 Hp electric-powered centrifugal pump mounted on a platform for pressurizing a large-sized 1,000 gpm and 50 psi) sprinkler or very large microirrigation (2,000 gpm and 30 psi) system or a very large-sized surface irrigation system (3,000 gpm) or a large-sized (2,000 gpm and 25 psi) waste transfer system. Resource Concerns: Water Quality degradation - Excess nutrients in surface and ground waters; Insufficient water - Inefficient use of irrigation water.Associated Practices include: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 449 - Irrigation Water Management; 313 - Waste Storage Facility; and 634 - Waste Transfer.

Before Situation:

Irrigation: An existing irrigation system employs an inefficient, improperly sized pump that prevents efficient water application resulting in water loss and high energy use.

After Situation:

A properly designed and efficient pumping plant is installed, reducing energy use and improving irrigation efficiency

Feature Measure: <Unknown>

Scenario Unit: Brake Horse Power

Scenario Typical Size: 50.00

Scenario Total Cost: $35,888.47

Scenario Cost/Unit: $717.77

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	2	$1,002.50
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	16	$1,058.88
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	56	$1,420.16
Portable Welder	1407	Portable field welder. Equipment only. Labor not included.	Hours	$19.45	16	$311.20
Crane, truck mounted, hydraulic, 12 ton	1734	12 ton capacity truck mounted hydraulic crane. Equipment cost only.	Hours	$284.50	16	$4,552.00
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	56	$2,456.72
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	16	$459.36
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	24	$963.12
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	56	$2,721.60
Materials						
Pump, > 30 HP, pump and motor, fixed cost portion	1013	Fixed cost portion of a pump greater than 30 HP, including the pump and motor. This portion is a base cost for the pump and is not dependent on horsepower. The total cost will include this fixed cost plus a variable cost portion. Includes material and shipping only.	Each	$6,467.67	1	$6,467.67
Pump, >30 HP, Pump and motor, variable cost portion	1014	Variable cost portion of a pump greater than 30 HP, including the pump and motor. This portion is dependent on the total horsepower for the pump. The total cost will include this variable cost plus a fixed cost portion. Includes material and shipping only.	Horsepower	$258.92	50	$12,946.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 533 - Pumping Plant

Scenario: #211 - Electric-Powered Pump >75

Scenario Description:

This is a close-coupled, 3-phase, 100 Hp electric-powered centrifugal pump mounted on a platform for pressurizing a very large (2500 gpm and 50 psi) sprinkler or a large-sized surface irrigation system (3,000 gpm).Resource Concerns: Water Quality degradation - Excess nutrients in surface and ground waters; Insufficient water - Inefficient use of irrigation water.Associated Practices include: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 449 - Irrigation Water Management; 313 - Waste Storage Facility; and 634 - Waste Transfer.

Before Situation:

Irrigation: An existing irrigation system employs an inefficient, improperly sized pump that prevents efficient water application resulting in water loss and high energy use.

After Situation:

Irrigation: A properly designed and efficient pumping plant is installed, reducing energy use and improving irrigation efficiency.

Feature Measure: Pump Power Requirement

Scenario Unit: Brake Horse Power

Scenario Typical Size: 100.00

Scenario Total Cost: $43,180.89

Scenario Cost/Unit: $431.81

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	4	$2,005.00
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	8	$529.44
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	56	$1,420.16
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	12	$526.44
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	56	$1,607.76
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	12	$481.56
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	56	$2,721.60
Materials						
Pump, > 30 HP, pump and motor, fixed cost portion	1013	Fixed cost portion of a pump greater than 30 HP, including the pump and motor. This portion is a base cost for the pump and is not dependent on horsepower. The total cost will include this fixed cost plus a variable cost portion. Includes material and shipping only.	Each	$6,467.67	1	$6,467.67
Pump, >30 HP, Pump and motor, variable cost portion	1014	Variable cost portion of a pump greater than 30 HP, including the pump and motor. This portion is dependent on the total horsepower for the pump. The total cost will include this variable cost plus a fixed cost portion. Includes material and shipping only.	Horsepower	$258.92	100	$25,892.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 533 - Pumping Plant

Scenario: #212 - Internal Combustion-Powered Pump <= 50HP

Scenario Description:

The typical scenario supports installation of a pump in an existing irrigation system or installation of a new pump on cropland with a 30 BHP pump. Size of pump is determined by required GPM and pressure derived from a design for specific irrigation system on cropland. The combination of higher solids content and volume require a larger horse power pump. This liquid manure pump is used to transfer semi-solid manure from a small reception pit located either below a barnyard or at the end of a free-stall barn or scrape alley. Resource Concerns: Water Quality degradation - Excess nutrients in surface and ground waters; Insufficient water - Inefficient use of irrigation water.Associated Practices include: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 449 - Irrigation Water Management; 313 - Waste Storage Facility; 634 - Waste Transfer; 436 - Irrigation Reservoir; and 447 - Irrigation System, Tailwater Recovery; and 614 - Watering Facility.

Before Situation:

Irrigation: Either an existing irrigation system employs an inefficient, improperly-sized pump that leads to inefficient water delivery resulting in high energy costs, or

Waste Transfer: various types of semi-solid or liquid waste at the headquarters is uncollected causing surface and ground water issues.

After Situation:

Irrigation Setting: For irrigation system, a properly designed pump is installed, reducing water and energy usage. Waste Transfer Setting: For semi-solid or liquid waste, wastes that have been collected through a waste transfer system are now efficiently transferred to appropriate treatment or storage facilities or crop application. Due to topography, gravity transfer is not possible and a properly sized pump is needed to transfer waste as part of a waste transfer system.

Feature Measure: Pump Power Requirement

Scenario Unit: Brake Horse Power

Scenario Typical Size: 30.00

Scenario Total Cost: $26,528.61

Scenario Cost/Unit: $884.29

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	1	$501.25
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	8	$529.44
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	4	$101.44
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	8	$350.96
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	32	$918.72
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	8	$321.04
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	16	$777.60
Materials						
Pump, < 50 HP, Pump & ICE power unit	1027	Materials, labor, controls: < 50 HP Pump & ICE power unit	Horsepower	$716.63	30	$21,498.90
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 533 - Pumping Plant

Scenario: #213 - Internal Combustion-Powered Pump > 50 to 70 HP

Scenario Description:
The typical scenario supports installation of a pump in an existing irrigation system or installation of a new pump on cropland with a 60 BHP pump. Size of pump is determined by required GPM and pressure derived from a design for specific irrigation system on cropland. The combination of higher solids content and volume require a larger horse power pump. This liquid manure pump is used to transfer semi-solid manure from a small reception pit located either below a barnyard or at the end of a free-stall barn or scrape alley. Resource Concerns: Water Quality degradation - Excess nutrients in surface and ground waters; Insufficient water - Inefficient use of irrigation water.Associated Practices include: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 449 - Irrigation Water Management; 313 - Waste Storage Facility; 634 - Waste Transfer; 436 - Irrigation Reservoir; and 447 - Irrigation System, Tailwater Recovery; and 614 - Watering Facility.

Before Situation:
Irrigation: Either an existing irrigation system employs an inefficient, improperly-sized pump that leads to inefficient water delivery resulting in high energy costs, or

Waste Transfer: various types of semi-solid or liquid waste at the headquarters is uncollected causing surface and ground water issues.

After Situation:
Irrigation Setting: For irrigation system, a properly designed pump is installed, reducing water and energy usage. Waste Transfer Setting: For semi-solid or liquid waste, wastes that have been collected through a waste transfer system are now efficiently transferred to appropriate treatment or storage facilities or crop application. Due to topography, gravity transfer is not possible and a properly sized pump is needed to transfer waste as part of a waste transfer system.

Feature Measure: Pump Power Requirement

Scenario Unit: Brake Horse Power

Scenario Typical Size: 60.00

Scenario Total Cost: $44,531.91

Scenario Cost/Unit: $742.20

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	1	$501.25
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	8	$529.44
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	4	$101.44
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	8	$350.96
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	32	$918.72
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	8	$321.04
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	16	$777.60
Materials						
Pump, > 50 to 70 HP, Pump & ICE power unit	1028	Materials, labor, controls: > 50 to 70 HP Pump & ICE power unit	Horsepower	$658.37	60	$39,502.20
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 533 - Pumping Plant

Scenario: #214 - Internal Combustion-Powered Pump > 70 HP

Scenario Description:

The typical scenario supports replacement of a pump in an existing irrigation system or installation of a new pump on cropland that is 75 break HP pump or larger. Size of pump is determined by required GPM and pressure derived from a design for specific irrigation system on cropland. Scenario could also be used for a pump for silage leachate, barnyard runoff, and milk house waste (as part of a waste transfer system) at farm headquarters. Resource Concerns: Water Quality degradation - Excess nutrients in surface and ground waters; Insufficient water - Inefficient use of irrigation water.Associated Practices include: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 449 - Irrigation Water Management; 313 - Waste Storage Facility; 634 - Waste Transfer; and 614 - Watering Facility.

Before Situation:

Irrigation: Either an existing irrigation system employs an inefficient, improperly-sized pump that leads to inefficient water delivery resulting in high energy costs,

orWaste Transfer: various types of semi-solid or liquid waste at the headquarters is uncollected causing surface and ground water issues.

After Situation:

Irrigation Setting: For irrigation system, a properly designed pump is installed, reducing water and energy usage. Waste Transfer Setting: For semi-solid or liquid waste, wastes that have been collected through a waste transfer system are now efficiently transferred to appropriate treatment or storage facilities or crop application. Due to topography, gravity transfer is not possible and a properly sized pump is needed to transfer waste as part of a waste transfer system.

Feature Measure: Pump Power Requirement

Scenario Unit: Brake Horse Power

Scenario Typical Size: 100.00

Scenario Total Cost: $70,324.84

Scenario Cost/Unit: $703.25

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	2	$1,002.50
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	8	$529.44
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	6	$152.16
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	8	$350.96
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	48	$1,378.08
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	8	$321.04
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	24	$1,166.40
Materials						
Pump, > 70 HP, Pump & ICE power unit	1029	Materials, labor, controls: > 70 HP Pump & ICE power unit	Horsepower	$638.95	100	$63,895.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 533 - Pumping Plant

Scenario: #215 - Tractor Power Take Off (PTO) Pump

Scenario Description:

This scenario involves a PTO driven pump to either transfer water for an irrigation system from a Pond - 378 (includes backflow prevention as appropriate) to cropland or; to transfer semi-solid/ liquid manure (as part of a waste transfer system) at the farm headquarters from a Waste Storage Facility - 313, to an irrigation system or waste treatment facility. In both cases, a PTO driven pump is selected because the landowner has equipment available to supply power to the pump. Electricity is not readily available and/or a stationary engine is not a practical alternative.Resource Concerns: Water Quality degradation - Excess nutrients in surface and ground waters; Insufficient water - Inefficient use of irrigation water.Associated Practices include: 430 - Irrigation Pipeline; 442 - Irrigation System, Sprinkler; 449 - Irrigation Water Management; 590 - Nutrient Management; 378 - Pond; 313 - Waste Storage Facility; and 634 - Waste Transfer.

Before Situation:

Irrigation Setting: An existing surface irrigation system employs an inefficient, improperly sized pump that leads to inefficient water delivery resulting in high energy costs; Waste Transfer Setting: various types of semi-solid or liquid waste at the headquarters are uncollected causing surface and ground water issues. A transfer method for waste is needed. Due to topography, gravity transfer is not possible and a properly sized pump is needed to transfer waste as part of a waste transfer system.

After Situation:

Irrigation Setting: A properly designed PTO-driven pump is installed, to transfer water to an Irrigation Pipeline (430) or Irrigation Canal or Lateral (320). Waste Transfer Setting: Wastes that have been collected through a waste transfer system are now efficiently transferred from a Waste Storage Facility (313) to an appropriate treatment facility or to an irrigation system. The pump typically will move 2,000 gallons per minute and is portable so that it can be used at several locations.

Feature Measure: Pump Power Requirement

Scenario Unit: Brake Horse Power

Scenario Typical Size: 60.00

Scenario Total Cost: $10,106.14

Scenario Cost/Unit: $168.44

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	2	$1,002.50
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	16	$405.76
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	16	$459.36
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	16	$777.60
Materials						
Pump, Ag Water PTO, 1,000 GPM	1923	Materials, labor, controls: Ag Water PTO Pump 1,000 GPM - 8 in.	Each	$7,460.92	1	$7,460.92

Practice: 533 - Pumping Plant

Scenario: #216 - Photovoltaic-Powered Pump, <4 kW

Scenario Description:

The typical scenario assumes installation of a submersible solar-powered pump in a well or a live stream. The installation includes the pump, wiring, drop pipe, solar panels, mounts, inverter, and all appurtenances. Note: It is generally not advisable to use a storage battery for a number of reasons. A storage tank is generally the most efficient method to store energy. Grazing - Livestock exclusion from surface water will result in improved surface water quality and reduced erosion. Irrigation - energy consumption will be reduced and the increased pressure and flow rates will improve irrigation efficiency.Resource Concerns: Insufficient stockwater.Associated Practices include: 374 - Farmstead Energy Improvement; 382 - Fence; 430 - Irrigation Pipeline; 436 - Irrigation Reservoir; 516 - Livestock Pipeline; 561 - Heavy Use Area Protection; and, 614 - Watering Facility.

Before Situation:

Livestock: Inadequate supply or location of water for a prescribed grazing system. Eroded stream banks and degraded water quality due to livestock access to stream. Cattle are not well-distributed because of remote water location. Irrigation: Pressure and flow rate is insufficient for uniform irrigation.

After Situation:

The typical scenario assumes installation of 1 kilowatt of photovoltaic (PV) panels, capable of operating a 1 horsepower solar-powered submersible pump in a well or other water source (Notes: 1) A PV panel is rated under standard and ideal conditions which will most likely not be replicated in the field; 2) 1 Horsepower is defined as 0.746 kilowatts.. The installation includes the pump, wiring, pipeline in the well, solar panels, frame mounts, controller, and all appurtenances. Water will be pumped to an existing storage tank at a higher elevation from which it will be used to pressurize the Livestock Pipeline (516) or Irrigation Pipeline (430). Grazing - Livestock exclusion from surface water will result in improved surface water quality and reduced erosion. Grazing has potential to be well distributed. Irrigation: Improved pressure and flow rate will improve irrigation efficiency.

Feature Measure: Pumping plant photovoltaic power

Scenario Unit: Kilowatt

Scenario Typical Size: 1.00

Scenario Total Cost: $8,867.93

Scenario Cost/Unit: $8,867.93

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	16	$405.76
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	16	$459.36
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	16	$777.60
Materials						
Solar Pumping System, Fixed Cost Portion	2495	Fixed cost portion of a solar powered pumping system. This portion is a base cost for a complete system including the photovoltaic panels, pumping plant, support braces, electric controllers, service drop, etc., and is not dependant on KiloWatt. The total cost will include this fixed cost plus a variable cost portion. Includes the cost of materials only.	Each	$3,392.29	1	$3,392.29
Solar Pumping System, Variable Cost Portion	2496	Variable cost portion of a solar powered pumping system. This portion IS dependent upon the total kilowatts of the photovoltaic panels, but also includes the pumping plant, support braces, electric controllers, service drop, etc. The total cost will include this variable cost plus a fixed cost portion. Includes the cost of materials only.	Kilowatt	$3,832.92	1	$3,832.92

Practice: 533 - Pumping Plant

Scenario: #217 - Water Ram Pump

Scenario Description:

A water ram is used to transfer water from a live stream to a Watering Facility (614) or small Irrigation Reservoir (436) utilizing the energy of moving water to transfer a portion of that water to a higher elevation. It is anchored to a small concrete pad. Bypass water (which could easily be 90% of the water diverted from the stream) is returned to the stream or transferred in a pipe, to a lower elevation tank (614 or 436), without erosion or impairment to water quality. In the livestock scenario, the objective is to provide water to the cattle outside of a live stream or other natural water source thereby eliminating a significant erosion situation while also improving water quality. The cattle thus have access to drinking water without having to enter the stream. The water ram may need to be fenced for protection from curious bovines. While it is generally not considered practical for irrigation, in the irrigation scenario, water can be retrieved from a stream and stored in a small 436 to provide water for a very small (0.1 acre) irrigation system.Resource Concerns: Insufficient stockwater.Associated Practices: 374 - Farmstead Energy Improvement; 382 - Fence; 430 - Irrigation Pipeline; 436 - Irrigation Reservoir; 516 - Livestock Pipeline; 561 - Heavy Use Area Protection; and, 614 - Watering Facility.

Before Situation:

Water in a nearby stream is not available at the desired location, pressure and/or flow rate.

After Situation:

A 2' diameter inlet pipe is installed and connected to a water ram pump with all appurtenances and anchored to a concrete pad (9 ft x 4 ft x 5 in) or other appropriate secure base. Depending upon the application, either a 1-inch diameter Livestock Pipeline (516) or an Irrigation Pipeline (430) is installed from the water ram to a 5,000 gallon storage facility. Improved water quantity or quality, grazing management, plant diversity, animal health, and/or irrigation purposes as outlined in the appropriate NRCS irrigation system standard. A 2' water ram, with 10 gpm of inlet flow and 10 feet of drop, can supply about 1.0 gpm to a location about 50 feet higher than the water ram.

Feature Measure: Number of Ram Pumps

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $2,248.59

Scenario Cost/Unit: $2,248.59

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	0.5	$250.63
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	16	$405.76
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	16	$459.36
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	16	$777.60
Materials						
Pump, Ram	1114	Ram pump kit, 2 inch. Includes materials and shipping only.	Each	$355.24	1	$355.24

Practice: 533 - Pumping Plant

Scenario: #218 - Livestock Nose Pump

Scenario Description:

A Nose Pump is a diaphragm pump located in a pasture for the purpose of providing water to cattle. For a permanent installation, it is typical to also install Heavy Use Area Protection (561) (separate contract item) where the cattle congregate around the pump. It is powered and operated by cattle to transfer water from a stream to a drinking bowl. The objective is to provide water to the cattle outside of a live stream or other natural water source thereby eliminating a significant erosion situation and while also improving water quality. The cattle thus have access to drinking water without having to enter the stream. Generally one nose pump is adequate for 20 cattle.Resource Concerns: Insufficient stockwater; Inefficient energy use - Equipment and facilities.Associated Practices include: 374 - Farmstead Energy Improvement; 382 - Fence; 516 - Livestock Pipeline; 561 - Heavy Use Area Protection; and, 614 - Watering Facility.

Before Situation:

Livestock have open access to a live stream or other existing natural water supply. Water supply is contaminated due to animal activity and stream banks are eroded on a daily basis. Improper cattle distribution results in poor water quality, poor grazing distribution, over grazing, and soil erosion.

After Situation:

One nose pump is installed with all appurtenances anchored to concrete pad with 6'x6'x10 Gauge reinforcement wire (9 ft x 4 ft x 5 in) or other appropriate secure base to supply water to cattle for improved livestock herd management. Additional Heavy Use Area Protection (561) in the form of crushed rock and at least 5 feet wide, may be installed (separate contract item) surrounding the concrete pad. Improved: water quality, soil quality, grazing management, plant diversity, and animal health.

Feature Measure: Number of Pumps

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $1,497.79

Scenario Cost/Unit: $1,497.79

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	0.5	$250.63
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	8	$202.88
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	8	$388.80
Materials						
Nose Pump	1052	Materials and delivery.	Each	$425.80	1	$425.80

Practice: 533 - Pumping Plant

Scenario: #250 - Variable Frequency Drive

Scenario Description:

This is an installation of electrical and electronic components designed to vary the frequency of the voltage to an electric motor and thus the ability to vary the speed of the motor. This directly affects pressure and flowrate. This also could give the operator the flexibility to operate several systems separately or at the same time.Resource concerns: Insufficient water - Inefficient use of irrigation water; Inefficient energy use - Equipment and facilities and Farming/ranching practices and field operations.Associated Practices: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 449 - Irrigation Water Management; 516 - Livestock Pipeline; and 614 - Watering Facility.

Before Situation:

Standard electrical connection from electrical utility to pump motor. No capability to match pump output pressure and/or flowrate to field(s) need(s). Result is over/under pressure(s) and/or flow rate(s), possible hydraulic anomalies, energy loss, and or inefficient water application in the irrigation system.

After Situation:

VFD Modifications are implemented at the pump site to allow for varying the speed of a 40 Hp electric motor to match the pressure and flow requirements for a center pivot irrigation system.

Feature Measure: Pump Power Requirement

Scenario Unit: Brake Horse Power

Scenario Typical Size: 50.00

Scenario Total Cost: $6,302.50

Scenario Cost/Unit: $126.05

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Variable Speed Drive, 50 HP	1288	Variable speed drive for 50 Horsepower electric motor. Does not include motor. Materials only.	Horsepower	$126.05	50	$6,302.50

Practice: 548 - Grazing Land Mechanical Treatment

Scenario: #8 - Pastureland Mechanical Treatment

Scenario Description:
This also applies to organic operations as well. Chisel plowing or subsoiling will be used to break the restrictive layers that will increase water infiltration,break up sod and thatch on introduced forages. Depth of treatment will be 1' deeper than the restictive layer.

Before Situation:
Forage growth on pastureland is limited by compacted soils layers and /or dense sod with a thatch build up.

After Situation:
Forage growth is increased due to greater rooting depths and water infiltration.

Feature Measure: area of treatmnent

Scenario Unit: Acres

Scenario Typical Size: 50.00

Scenario Total Cost: $2,174.81

Scenario Cost/Unit: $43.50

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Ripper or subsoiler, 16 to 36 inch depth	1235	Deep ripper or subsoiler, (16-36 inches depth) includes tillage implement, power unit and labor.	Acres	$23.61	50	$1,180.50
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 550 - Range Planting

Scenario: #69 - Native -Standard prep

Scenario Description:
Establishment of a mixture of PREDOMINANTLY NATIVE adapted perennial species on a rangeland unit to improve forage condition, improve wildlife habitat and/or reduce erosion. Seed mix of Predominantly Native species is chosen based on range conditions and availability of seed. Planting by preparing a seedbed with a LIGHT TO MODERATE TILLAGE and seeding with a no-till drill, range drill, or broadcasting.

Before Situation:
Rangeland with existing stand of perennial or annual grasses OR monoculture OR no grasses present where natural reseeding or vegetation enhancement by grazing management alone is unlikely. Resource Concerns may include: undesirable plant productivity and health, inadequate feed and forage for livestock, soil erosion and soil quality.

After Situation:
Establishment of PREDOMINANTLY NATIVE adapted perennial vegetation such as grasses, forbs, legumes, shrubs, and trees to improve forage quality and quantity and reduce soil erosion on rangeland, native or naturalized pasture, grazed forest or other suitable location.

Feature Measure: Acres of Range Planting

Scenario Unit: Acres

Scenario Typical Size: 80.00

Scenario Total Cost: $14,763.91

Scenario Cost/Unit: $184.55

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	80	$1,190.40
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	80	$1,781.60
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Materials						
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$134.97	80	$10,797.60
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 550 - Range Planting

Scenario: #70 - Non-Native - Standard prep

Scenario Description:
Establishment of a mixture of PREDOMINANTLY NON-NATIVE adapted perennial species on a rangeland unit to improve forage condition, improve wildlife habitat and/or reduce erosion. Seed mix of Predominantly Non-Native species is chosen based on range conditions and availability of seed. Planting by preparing a seedbed with a LIGHT TO MODERATE tillage and seeding with a no-till drill, range drill, or broadcasting.

Before Situation:
Rangeland with existing stand of perennial or annual grasses OR monoculture OR no grasses present where natural reseeding or vegetation enhancement by grazing management alone is unlikely. Resource concerns may include: undesirable plant productivity and health, inadequate feed and forage for livestock, soil erosion and soil quality.

After Situation:
Establishment of PREDOMINANTLY NON-NATIVE adapted perennial vegetation such as grasses, forbs, legumes, shrubs, and trees to improve forage quality and quantity and reduce soil erosion on rangeland, native or naturalized pasture, grazed forest or other suitable location.

Feature Measure: Acres of Range Planting

Scenario Unit: Acres

Scenario Typical Size: 80.00

Scenario Total Cost: $7,787.11

Scenario Cost/Unit: $97.34

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	80	$1,190.40
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	80	$1,781.60
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Materials						
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$47.76	80	$3,820.80
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 554 - Drainage Water Management

Scenario: #1 - Drainage Water Management

Scenario Description:

This scenario describes the management of a drainage water management system in a row crop field with subsurface drainage system already installed or planned to be installed with control structures, or a surface water management system with berms or levees around the field and control structures. Implementation of DWM results in improved water quality by reducing nutrient losses from the soil through ground or surface water outside of the growing season. Management of the water table results in more ground water available for crops during the growing season while lowering the water table prior to crop planting and crop harvest to avoid causing compaction.

Before Situation:

In this scenario the gently sloping cropland is drained with pattern subsurface drainage (typically perforated corrugated plastic tubing). The purpose of the drainage system is to decrease soil moisture conditions during planting and harvesting of crop. Subsurface drainage is not restricted at anytime during the year resulting in a permanently lowered water table which is typically 3-4 feet below the surface and well below the crop root zone. Excess ground water is discharged directly to adjacent receiving streams. Excess subsurface drainage contributes to degraded water quality from excessive nutrient discharge; less vigorous crop growth from lowered water table.

After Situation:

Typical systems consist of a 50 acre field with existing drainage tile lines and 5 installed water control structures. The operator goes to the field in order to adjust water control structures (riser boards). While on site the date and adjustment information is recorded/logged. The number of yearly adjustments is based on 6 trips to a field 5 miles from headquarters. The field time to make and record each adjustment is 0.5 hours per structure (including travel time). The typical field will contain 5 water control structures.Resource Concern: Water Quality - Excess Nutrients in surface and ground waters. Insufficient Water - Insufficient Moisture Management.Associated Practices: 329:Residue Management - No Till/Strip Till; 606-Subsurface Drain; 607-Surface Drain, Field Ditch; 608-Surface Drain, Main or Lateral; 587-Structure for Water Control; 590-Nutrient Management.

Feature Measure: Area impacted controlled by the w

Scenario Unit: Acres

Scenario Typical Size: 50.00

Scenario Total Cost: $658.05

Scenario Cost/Unit: $13.16

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	15	$658.05

Practice: 554 - Drainage Water Management

Scenario: #18 - Automated Drainage Water Management

Scenario Description:
This scenario is the process of managing the drainage water discharge volume and water table elevation by regulating the flow from surface and/or subsurface agricultural drainage systems utilizing automation. Typical systems consist of a field with a fairly flat slope (less than 2% and preferably less than 1%) with existing drainage tile lines and installed water control structures which are operated with automated slide gates, and telemetry data systems coupled with cloud data management. Typical affected area for an automated drainage water management structure is 10 to 20 acres. The operator, from handheld device, adjusts water control structures (gate elevation) and logs data. Educational meeting is conducted between consultant and operator(s) annually for essential knowledge transfer Resource Concern: Water Quality - Excess Nutrients in surface and ground waters. Associated Practices: 606-Subsurface Drain; 607-Surface Drain, Field Ditch; 608-Surface Drain, Main or Lateral; 587-Structure for Water Control; 590-Nutrient Management.

Before Situation:
Existing inefficient drainage systems are in place and water flows uncontrolled, resulting in sediment and nutrient laden outflow entering ditches or streams.

After Situation:
Existing drainage systems are managed utilizing telemetry and real-time data to retain moisture in the soil for plant uptake and to allow for enhanced nutrient utilization.

Feature Measure: Acres of Managed Drainage

Scenario Unit: Acres

Scenario Typical Size: 50.00

Scenario Total Cost: $494.02

Scenario Cost/Unit: $9.88

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.39	1	$116.39
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	7.5	$329.03
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	1	$48.60

Practice: 558 - Roof Runoff Structure

Scenario: #1 - Existing fascia, Small 4 to 6 inch gutter, normal hangers

Scenario Description:

A roof runoff structure, consisting of gutter(s), downspout(s), and appropriate outlet facilities. Used to keep roof clean water runoff uncontaminated and provide a stable outlet to ground surface. Facilitates waste management and protects environment by minimizing clean water additions to waste systems and addresses water quality concerns. If the roof runoff water needs to be piped to a safe outlet then contract 620, Underground Outlet Associated practices include Waste Storage Facility (313), Composting Facility (317), Heavy Use Area Protection (561), Watering Facility (614), Underground Outlet (620), Diversion (362), and any relevant irrigation practices.

Before Situation:

Applicable where: (1) a roof runoff management facility is included in an overall plan for an overall plan for a waste management system; (2) roof runoff needs to be diverted away from structures or contaminated areas; (3) there is a need to collect, control, and transport runoff from roofs to a stable outlet.

After Situation:

A gutter, downspout, and outlet system servicing the portion of the building roof that would otherwise drain into a waste management system or create erosion. Roof line of 100 ft serviced with gutter, downspouts, and appurtances.

Feature Measure: Linear Length of Roof to be Guttere

Scenario Unit: Feet

Scenario Typical Size: 100.00

Scenario Total Cost: $1,344.98

Scenario Cost/Unit: $13.45

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	10	$287.10
Materials						
Gutter, Aluminum, Small	1689	Aluminum gutter, 4 to 6 in. width with hangers. Materials only.	Feet	$3.60	100	$360.00
Downspout, Aluminum	1700	Aluminum downspout 3 to 5 inch width with hangers. Materials only.	Feet	$3.00	30	$90.00
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	2	$607.88

Practice: 558 - Roof Runoff Structure

Scenario: #2 - Existing fascia, Small 4 to 6 inch gutter, Heavy duty hangers

Scenario Description:

A roof runoff structure, consisting of gutter(s), downspout(s), and appropriate outlet facilities. Used to keep roof clean water runoff uncontaminated and provide a stable outlet to ground surface. Facilitates waste management and protects environment by minimizing clean water additions to waste systems and addresses water quality concerns. Associated practices include Waste Storage Facility (313), Composting Facility (317), Heavy Use Area Protection (561), Watering Facility (614), Underground Outlet (620), Diversion (362), and any relevant irrigation practices.

Before Situation:

Applicable where: (1) a roof runoff management facility is included in an overall plan for an overall plan for a waste management system; (2) roof runoff needs to be diverted away from structures or contaminated areas; (3) there is a need to collect, control, and transport runoff from roofs to a stable outlet.

After Situation:

A gutter, downspout, and outlet system servicing the portion of the building roof that would otherwise drain into a waste management system or create erosion. Roof line of 100 ft serviced with gutter, downspouts, and appurtances. This scenario incluldes heavy duty hangers and wrap-around straps for snow supports.

Feature Measure: Linear Length of Roof to be Guttere

Scenario Unit: Feet

Scenario Typical Size: 100.00

Scenario Total Cost: $1,609.80

Scenario Cost/Unit: $16.10

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	16	$459.36
Materials						
Gutter, Aluminum, Small	1689	Aluminum gutter, 4 to 6 in. width with hangers. Materials only.	Feet	$3.60	100	$360.00
Downspout, Aluminum	1700	Aluminum downspout 3 to 5 inch width with hangers. Materials only.	Feet	$3.00	30	$90.00
Gutter, Wrap-around Straps	2176	Roof gutter snow and Ice supports, 28 gauge. Materials only.	Each	$5.54	13	$72.02
Gutter, heavy duty hangers	2179	Roof heavy duty hangers, 16 guage. Materials only.	Each	$1.58	13	$20.54
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	2	$607.88

Practice: 558 - Roof Runoff Structure

Scenario: #3 - New fascia, Small 4 to 6 inch gutter, Heavy duty hangers

Scenario Description:

A roof runoff structure, consisting of gutter(s), downspout(s), and appropriate outlet facilities. Used to keep roof clean water runoff uncontaminated and provide a stable outlet to ground surface. Facilitates waste management and protects environment by minimizing clean water additions to waste systems and addresses water quality concerns. Associated practices include Waste Storage Facility (313), Composting Facility (317), Heavy Use Area Protection (561), Watering Facility (614), Underground Outlet (620), Diversion (362), and any relevant irrigation practices.

Before Situation:

Applicable where: (1) a roof runoff management facility is included in an overall plan for an overall plan for a waste management system; (2) roof runoff needs to be diverted away from structures or contaminated areas; (3) there is a need to collect, control, and transport runoff from roofs to a stable outlet.

After Situation:

A gutter, downspout, and outlet system servicing the portion of the building roof that would otherwise drain into a waste management system or create erosion. Roof line of 100 ft serviced with gutter, downspouts, and appurtances. This scenario incluldes heavy duty hangers and wrap-around straps for snow supports. It also includes new fascia.

Feature Measure: Linear Length of Roof to be Guttere

Scenario Unit: Feet

Scenario Typical Size: 100.00

Scenario Total Cost: $2,368.82

Scenario Cost/Unit: $23.69

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	24	$689.04
Materials						
Dimension Lumber, untreated, rot resistant	1613	Untreated dimension lumber with nominal thickness equal or less than 2 inches, milled from a rot resistant species such as cedar. Includes lumber and fasteners. Does not include labor.	Board Feet	$3.98	133	$529.34
Gutter, Aluminum, Small	1689	Aluminum gutter, 4 to 6 in. width with hangers. Materials only.	Feet	$3.60	100	$360.00
Downspout, Aluminum	1700	Aluminum downspout 3 to 5 inch width with hangers. Materials only.	Feet	$3.00	30	$90.00
Gutter, Wrap-around Straps	2176	Roof gutter snow and Ice supports, 28 gauge. Materials only.	Each	$5.54	13	$72.02
Gutter, heavy duty hangers	2179	Roof heavy duty hangers, 16 guage. Materials only.	Each	$1.58	13	$20.54
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	2	$607.88

Practice: 558 - Roof Runoff Structure

Scenario: #4 - Existing fascia, Medium 7 to 9 inch gutter, normal hangers

Scenario Description:

A roof runoff structure, consisting of gutter(s), downspout(s), and appropriate outlet facilities. Used to keep roof clean water runoff uncontaminated and provide a stable outlet to ground surface. Facilitates waste management and protects environment by minimizing clean water additions to waste systems and addresses water quality concerns. If the roof runoff water needs to be piped to a safe outlet then contract 620, Underground Outlet Associated practices include Waste Storage Facility (313), Composting Facility (317), Heavy Use Area Protection (561), Watering Facility (614), Underground Outlet (620), Diversion (362), and any relevant irrigation practices.

Before Situation:

Applicable where: (1) a roof runoff management facility is included in an overall plan for an overall plan for a waste management system; (2) roof runoff needs to be diverted away from structures or contaminated areas; (3) there is a need to collect, control, and transport runoff from roofs to a stable outlet.

After Situation:

A gutter, downspout, and outlet system servicing the portion of the building roof that would otherwise drain into a waste management system or create erosion. Roof line of 200 ft serviced with gutter, downspouts, and appurtenances.

Feature Measure: Linear Length of Roof to be Guttere

Scenario Unit: Feet

Scenario Typical Size: 200.00

Scenario Total Cost: $4,298.79

Scenario Cost/Unit: $21.49

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	21	$602.91
Materials						
Gutter, Aluminum, Medium	1690	Aluminum gutter, 7 to 9 in. width with hangers. Materials only.	Feet	$14.69	200	$2,938.00
Downspout, Aluminum	1700	Aluminum downspout 3 to 5 inch width with hangers. Materials only.	Feet	$3.00	50	$150.00
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	2	$607.88

Practice: 558 - Roof Runoff Structure

Scenario: #5 - Medium 7 to 9 inch gutter, Heavy hangers

Scenario Description:

A roof runoff structure, consisting of gutter(s), downspout(s), and appropriate outlet facilities. Used to keep roof clean water runoff uncontaminated and provide a stable outlet to ground surface. Facilitates waste management and protects environment by minimizing clean water additions to waste systems and addresses water quality concerns. Associated practices include Waste Storage Facility (313), Composting Facility (317), Heavy Use Area Protection (561), Watering Facility (614), Underground Outlet (620), Diversion (362), and any relevant irrigation practices.

Before Situation:

Applicable where: (1) a roof runoff management facility is included in an overall plan for an overall plan for a waste management system; (2) roof runoff needs to be diverted away from structures or contaminated areas; (3) there is a need to collect, control, and transport runoff from roofs to a stable outlet.

After Situation:

A gutter, downspout, and outlet system servicing the portion of the building roof that would otherwise drain into a waste management system or create erosion. Roof line of 200 ft serviced with gutter, downspouts, and appurtances. This scenario incluldes heavy duty hangers with roof straps and wrap-around straps for snow supports.

Feature Measure: Linear Length of Roof to be Guttere

Scenario Unit: Feet

Scenario Typical Size: 200.00

Scenario Total Cost: $5,356.13

Scenario Cost/Unit: $26.78

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	50	$1,435.50
Materials						
Gutter, Aluminum, Medium	1690	Aluminum gutter, 7 to 9 in. width with hangers. Materials only.	Feet	$14.69	200	$2,938.00
Downspout, Aluminum	1700	Aluminum downspout 3 to 5 inch width with hangers. Materials only.	Feet	$3.00	60	$180.00
Gutter, Wrap-around Straps	2176	Roof gutter snow and Ice supports, 28 gauge. Materials only.	Each	$5.54	25	$138.50
Gutter, roof straps	2177	Roof gutter snow and Ice gutter supports, 19 gauge. Materials only.	Each	$0.67	25	$16.75
Gutter, heavy duty hangers	2179	Roof heavy duty hangers, 16 guage. Materials only.	Each	$1.58	25	$39.50
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	2	$607.88

Practice: 558 - Roof Runoff Structure

Scenario: #16 - Concrete Curb

Scenario Description:

A roof runoff structure, consisting of a concrete curb or parabolic channel installed on existing impervious surface or the ground with appropriate outlet facilities. Environmental/design considerations, for example ??? snow loads, or a building without proper structural support needed for gutters dictate the use of an on-ground concrete curb. Used to keep roof clean water runoff uncontaminated and provide a stable outlet to ground surface. Facilitates waste management and protects the environment by minimizing clean water additions to waste systems and addresses water quality concerns. Associated practices include Waste Storage Facility (313), Composting Facility (317), Heavy Use Area Protection (561), Underground Outlet (620), and Diversion (362).

Before Situation:

Applicable where: (1) a roof runoff management facility is included in an overall plan for an overall plan for a waste management system; (2) roof runoff needs to be diverted away from structures or contaminated areas; (3) there is a need to collect, control, and transport runoff from roofs to a stable outlet.

After Situation:

A concrete curb or parabolic channel and outlet system servicing the portion of the building roof that would otherwise drain into a waste management system or create erosion. Concrete curb (6' high - 2' wide) extending the length of a 200' roof with additional length (5') for stable outlet.

Feature Measure: Linear Length of Roof to be Curbed

Scenario Unit: Feet

Scenario Typical Size: 200.00

Scenario Total Cost: $4,328.68

Scenario Cost/Unit: $21.64

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formless, non reinforced	36	Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$220.05	10	$2,200.50
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.11	16	$17.76
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	30	$75.60
Demolition, concrete	1498	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yards	$11.57	6	$69.42
Hauling, bulk, highway truck	1615	Hauling of bulk earthfill, rockfill, waste or debris. One-way travel distance using fully loaded highway dump trucks (typically 16 CY or 20 TN capacity). Includes equipment and labor for truck only. Does not include cost for loading truck.	Cubic Yard Mile	$0.36	60	$21.60
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	7	$202.02
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	7	$212.52
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 558 - Roof Runoff Structure

Scenario: #17 - Trench Drain

Scenario Description:

A roof runoff structure, consisting of a trench filled with rock, with a polyethylene, corrugated, perforated drain tile installed in trench bottom. Used to keep clean water runoff uncontaminated and provide a stable outlet to ground surface. Environmental/design considerations, for example ??? snow loads, or a building without proper structural support needed for gutters dictate the use of a trench drain. Facilitates waste management and protects the environment by minimizing clean water additions to waste systems and addresses water quality concerns. Associated practices include Waste Storage Facility (313), Composting Facility (317), Heavy Use Area Protection (561), Underground Outlet (620), and Diversion (362).

Before Situation:

Applicable where: (1) roof runoff structure is included in an overall plan for a waste management system; (2) roof runoff needs to be diverted away from structures or contaminated areas; (3) there is a need to collect, control, and transport runoff from roofs to a stable outlet.

After Situation:

A 2' deep by 3' wide by 200 long deep rock filled, tile drained trench is installed along a livestock building to keep clean water from entering the waste storage system. A concrete apron needs to be removed at a building equipment door way to install the trench drain and then repair the concrete apron area over the trench drain. A standard small excavator, track mounted is typical trenching equipment. Clean water is redirected to a safe outlet and no longer flowing into the waste storage system or causing soil erosion.

Feature Measure: Linear Length of Roof to be Drained

Scenario Unit: Feet

Scenario Typical Size: 200.00

Scenario Total Cost: $5,091.69

Scenario Cost/Unit: $25.46

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.11	222	$246.42
Hydraulic Excavator, .5 CY	930	Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included.	Hours	$101.18	4	$404.72
Concrete, CIP, Slab on Grade, non reinforced	1225	Non reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$309.79	2	$619.58
Demolition, concrete	1498	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yards	$11.57	2	$23.14
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	4	$121.44
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	45	$1,366.20
Pipe, HDPE, corrugated single wall, <= 12 in. weight priced Compound	1380	High Density Polyethylene (HDPE) compound manufactured into single wall corrugated pipe or tubing. Materials only.	Pound	$2.09	238.7	$498.88
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	250	$250.00
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Aggregate, Shipping, Cubic Yard-mile	2360	Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul).	Cubic Yard Mile	$0.42	1350	$567.00

Practice: 558 - Roof Runoff Structure

Scenario: #30 - High Tunnel Roof Runoff Trench Drain and Storage

Scenario Description:
NOT TO BE USED WHERE CONTAMINATED SOIL EXIST. An urban agricultural producer wishes to address a resource concern such as a need for water or erosion around high tunnel from roof runoff and collect and store roof runoff for reuse as supplemental irrigation/water supply water. Associated Practice: High Tunnel

Before Situation:
Producer has resource concern such as erosion caused by roof runoff from an installed high tunnel

After Situation:
A 2' deep by 3' wide by 100' long trench filled with clean stone w/ 4-8 inch perforated PE pipe located on both sides of the hightunnel collect the roof runoff and divert to an underground storage tank. Trench drain typically installed at ground level under the edge of a high tunnel. Outlet from 'Trench Drain' conveys water to a buried storage tank. Typically installed to capture water for reuse or to stop erosion caused by concentrated roof runoff.

Feature Measure: Length of hightunnel

Scenario Unit: Linear Feet

Scenario Typical Size: 100.00

Scenario Total Cost: $4,432.54

Scenario Cost/Unit: $44.33

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.11	227	$251.97
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	10	$62.50
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yards	$3.67	72	$264.24
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	10	$287.10
Materials						
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$23.32	46	$1,072.72
Pipe, HDPE, corrugated single wall, <= 12 in. weight priced Compound	1380	High Density Polyethylene (HDPE) compound manufactured into single wall corrugated pipe or tubing. Materials only.	Pound	$2.09	15.2	$31.77
Prefabricated concrete septic tank, 1500 gal	1738	Precast concrete septic tank, 1,500 gal. Materials only.	Each	$1,356.97	1	$1,356.97
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 558 - Roof Runoff Structure

Scenario: #44 - Roof Gutter, 6 inches wide with runoff Storage Tank

Scenario Description:

A roof runoff structure, consisting of gutter(s), downspout(s), and a storage tank. Used to keep roof clean water runoff uncontaminated, provide storage for on-farm use of roof water and a stable outlet for any excess to ground surface in a way that avoids erosion. Facilitates waste management and protects environment by minimizing clean water additions to waste systems and addresses water quality concerns. Associated practices include Waste Storage Facility (313), Composting Facility (317), Heavy Use Area Protection (561), Watering Facility (614), Underground Outlet (620), Diversion (362), and any relevant irrigation practices.

Before Situation:

Applicable where: (1) a roof runoff management facility is included in an overall plan for an overall plan for a waste management system; (2) roof runoff needs to be diverted away from structures or contaminated areas; (3) there is a need to collect, control, and transport runoff from roofs to a stable outlet.

After Situation:

A gutter and downspouts servicing the portion of the building roof that would otherwise drain into a waste management system or create erosion. Roof line of 200 ln.ft. serviced with gutter, downspouts, and appurtances. A 1,500 gallon tank is installed for storage and use of roof runoff.

Feature Measure: Linear Length of Roof to be Guttere

Scenario Unit: Feet

Scenario Typical Size: 200.00

Scenario Total Cost: $4,218.59

Scenario Cost/Unit: $21.09

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	2	$12.50
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	1	$43.87
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	20	$574.20
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	2	$60.72
Tank, Poly Enclosed Storage, >1,000	1075	Water storage tanks. Includes materials and shipping only.	Gallons	$1.18	1500	$1,770.00
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.29	223.3	$511.36
Gutter, Aluminum, Small	1689	Aluminum gutter, 4 to 6 in. width with hangers. Materials only.	Feet	$3.60	200	$720.00
Downspout, Aluminum	1700	Aluminum downspout 3 to 5 inch width with hangers. Materials only.	Feet	$3.00	60	$180.00
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94
Aggregate, Shipping, Cubic Yard-mile	2360	Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul).	Cubic Yard Mile	$0.42	100	$42.00

Practice: 560 - Access Road

Scenario: #1 - Raised Earth

Scenario Description:

Newly constructed compacted earth road in well drained areas 14 feet wide. A properly constructed, well defined access road will address resource concerns related with compaction, emissions of fugitive dust, and excessive sediment in surface water. Short term air quality deterioration may result if proper dust control measures are not implemented during the practice installation. Costs include some earthfill, shaping, grading, including the equipment, labor and incidental materials necessary to install the practice.

Before Situation:

An agricultural enterprise which requires, but does not have, a fixed travelway for equipment and vehicles for various resource activities and where use of equipment and vehicles within the enterprise without a defined access road would result in compaction, excessive sediment and turbidity in surface water, reduced visibility, and emissions of fugitive dust. This scenario is applicable where the resource activity areas consist of well drained soils.

After Situation:

The road will be 14 feet wide at the top, mostly in embankment less than 1 feet in height, (average .5 ft) typical side slopes 2:1. A properly constructed, well defined access road will greatly reduce or eliminate compaction in land use areas where it is harmful, reduce emissions of fugitive dust and also reduce excessive sediment in surface water by reducing uncontrolled sediment transport and improving drainage of irrigated lands. Planned grades will include all dips and water bars. If clearing and grubbing of land in the alignment area is required, use Land Clearing (460). Pipe culverts installed as part of access road should be covered by either Structures for Water Control (587) or Stream Crossings (578) depending on the type of structure. Earthfill embankment above the culvert structure would still be covered by this Practice. Diversions constructed as part of access road should be covered by Diversion (362). When seeding or revegetation is required, use Critical Area Planting (342). Dust control must be addressed under Dust Control on Unpaved Roads and Surfaces (373).

Feature Measure: Length of Roadway

Scenario Unit: Feet

Scenario Typical Size: 500.00

Scenario Total Cost: $2,670.64

Scenario Cost/Unit: $5.34

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	153	$613.53
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.45	153	$527.85
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 560 - Access Road

Scenario: #2 - Gravel

Scenario Description:

Newly Constructed gravel road with min. 6 inch thick compacted gravel surface in moderately well drained areas. A properly constructed, well defined access road will address resource concerns related with compaction, emissions of fugitive dust, and excessive sediment in surface water. Short term air quality deterioration may result if proper dust control measures are not implemented during the practice installation. Costs include earthfill, shaping, grading, surface material, some seeding including the equipment, labor and materials necessary to install the practices.

Before Situation:

An agricultural enterprise which requires, but does not have, a fixed travel way for equipment and vehicles for various resource activities and where use of equipment and vehicles within the enterprise without a defined access road would result in compaction, excessive sediment and turbidity in surface water, reduced visibility, and emissions of fugitive dust. This scenario is applicable where the resource activity areas consist of relatively wet and swampy but level terrain lands.

After Situation:

The road will be 14 feet wide with 6 inch gravel surfacing at the top and 5 feet of seeding along both sides of the road. The embankment is less than 1 feet in height, (average .5 ft) typical side slopes 2:1. A properly constructed, well defined access road will greatly reduce sheet, rill and wind erosion, eliminate compaction in land use areas where it is harmful, reduce emissions of particulate matter (PM) and PM precursors and also reduce excessive sediment in surface water by reducing uncontrolled sediment transport. Planned grades will include all dips and water bars. If clearing and grubbing of land in the alignment area is required, use Land Clearing (460). Pipe culverts installed as part of access road should be covered by either Structures for Water Control (587) or Stream Crossings (578) depending on the type of structure. Earthfill embankment above the culvert structure would still be covered by this Practice. Diversions constructed as part of access road should be covered by Diversion (362). Dust control must be addressed under Dust Control on Unpaved Roads and Surfaces (373).

Feature Measure: Length of Roadway

Scenario Unit: Feet

Scenario Typical Size: 500.00

Scenario Total Cost: $7,803.00

Scenario Cost/Unit: $15.61

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.45	174	$600.30
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	7	$548.10
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.61	0.11	$0.84
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	6	$172.26
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	7	$280.91
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	153	$4,645.08
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	6.9	$4.69
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.81	6.9	$5.59
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	6.9	$4.69
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$26.18	0.23	$6.02
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$47.76	0.11	$5.25
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 560 - Access Road

Scenario: #3 - Gravel over Geotextile

Scenario Description:

Newly Constructed gravel road with min. 12 inch thick compacted gravel surface over geotextile in somewhat poorly drained areas. A properly constructed, well defined access road will address resource concerns related with compaction, emissions of fugitive dust, and excessive sediment in surface water. Short term air quality deterioration may result if proper dust control measures are not implemented during the practice installation. Costs include some earthfill, shaping, grading, surface material, some seeding including the equipment, labor and materials necessary to install the practices.

Before Situation:

An agricultural enterprise which requires, but does not have, a fixed travel way for equipment and vehicles for various resource activities and where use of equipment and vehicles within the enterprise without a defined access road would result in compaction, excessive sediment and turbidity in surface water, reduced visibility, and emissions of fugitive dust. This scenario is applicable where the resource activity areas consist of relatively wet and swampy but level terrain lands.

After Situation:

The road will be 14 feet wide with 12 inch gravel surfacing over woven or non-woven geotextile and 5 feet of seeding along both sides of the road. The road is constructed with an embankment of 1 foot in height, (average 1 ft) typical side slopes 2:1. A properly constructed, well defined access road will greatly reduce sheet, rill and wind erosion, eliminate compaction in land use areas where it is harmful, reduce emissions of particulate matter (PM) and PM precursors and also reduce excessive sediment in surface water by reducing uncontrolled sediment transport. Planned grades will include all dips and water bars. If clearing and grubbing of land in the alignment area is required, use Land Clearing (460). Pipe culverts installed as part of access road should be covered by either Structures for Water Control (587) or Stream Crossings (578) depending on the type of structure. Earthfill embankment above the culvert structure would still be covered by this Practice. Diversions constructed as part of access road should be covered by Diversion (362). Dust control must be addressed under Dust Control on Unpaved Roads and Surfaces (373), or Critical Area Planting (342) where a larger area of seeding is needed.

Feature Measure: Length of Roadway

Scenario Unit: Feet

Scenario Typical Size: 500.00

Scenario Total Cost: $16,842.14

Scenario Cost/Unit: $33.68

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.45	326	$1,124.70
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	13	$1,017.90
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.61	0.11	$0.84
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	22	$631.62
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	13	$521.69
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	326	$9,897.36
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	6.9	$4.69
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.81	6.9	$5.59
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	6.9	$4.69
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$26.18	0.23	$6.02
Geotextile, non-woven, heavy weight	1210	Non-woven greater than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	$1.89	850	$1,606.50
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$47.76	0.11	$5.25
Mobilization						

Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 560 - Access Road

Scenario: #4 - Gravel over Base Course

Scenario Description:

Newly Constructed gravel road with min. 4 inch thick compacted gravel surface over 9' base course of graded rock in somewhat poorly drained areas. A properly constructed, well defined access road will address resource concerns related with compaction, emissions of fugitive dust, and excessive sediment in surface water. Short term air quality deterioration may result if proper dust control measures are not implemented during the practice installation. Costs include some earthfill, shaping, grading, surface material, some seeding, including the equipment, labor and incidental materials necessary to install the practices.

Before Situation:

An agricultural enterprise with an existing access road which is beyond its useful lifespan, can no longer be used as intended without rehabilitation. If left in its current condition , it will result in continued compaction, excessive sediment in surface water and emissions of fugitive dusts. This scenario is applicable where the resource activity areas with an existing but dilapidated access road consist of relatively dry and level terrain lands.

After Situation:

The road will be 14 feet width at the top, mostly in embankment less than 2 feet in height, (average 6 in), typical side slopes 2:1. 4 inch thick compacted gravel surface over 9' base course of graded rock and 5 feet of seeding along both sides of the road. A properly repaired access road will greatly reduce or eliminate compaction in land use areas where it is harmful, reduce emissions of fugitive dust and also reduce excessive sediment in surface water by reducing uncontrolled sediment transport and improving drainage of irrigated lands. Planned grades will include all dips and water bars. If clearing and grubbing of land in the alignment area is required, use Land Clearing (460). Pipe culverts installed as part of access road should be covered by either Structures for Water Control (587) or Stream Crossings (578) depending on the type of structure. Earthfill embankment above the culvert structure would still be covered by this Practice. Diversions constructed as part of access road should be covered by Diversion (362). Dust control must be addressed under Dust Control on Unpaved Roads and Surfaces (373), or Critical Area Planting (342) were a larger area of seeding is needed.

Feature Measure: Length of Roadway

Scenario Unit: Feet

Scenario Typical Size: 500.00

Scenario Total Cost: $13,438.54

Scenario Cost/Unit: $26.88

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.45	174	$600.30
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	15	$1,174.50
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.61	0.11	$0.84
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	6	$172.26
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	15	$601.95
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	100	$3,036.00
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	6.9	$4.69
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.81	6.9	$5.59
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	6.9	$4.69
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$26.18	0.23	$6.02
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$23.32	257	$5,993.24
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$47.76	0.11	$5.25
Mobilization						

Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 560 - Access Road

Scenario: #5 - Gravel over Base Course over Geotextile

Scenario Description:

Newly Constructed gravel road with min. 4 inch thick compacted gravel surface over 9' base course of graded rock over geotextile in poorly drained areas. A properly constructed, well defined access road will address resource concerns related with compaction, emissions of fugitive dust, and excessive sediment in surface water. Short term air quality deterioration may result if proper dust control measures are not implemented during the practice installation. Costs include some earthfill, shaping, grading, surface material, some seeding including the equipment, labor and materials necessary to install the practices.

Before Situation:

An agricultural enterprise with an existing access road which is beyond its useful lifespan, can no longer be used as intended without rehabilitation. If left in its current condition , it will result in continued compaction, excessive sediment in surface water and emissions of fugitive dusts. This scenario is applicable where the resource activity areas with an existing but dilapidated access road consist of relatively wet and swampy but level terrain lands.

After Situation:

The road will be 14 feet wide with 4 inch gravel surfacing over 9' base course of graded rock over woven or non-woven geotextile and 5 feet of seeding along both sides of the road. It is mostly in embankment less than 2 feet in height, (average 12 inches) typical side slopes 2:1. A properly constructed, well defined access road will greatly reduce sheet, rill and wind erosion, eliminate compaction in land use areas where it is harmful, reduce emissions of particulate matter (PM) and PM precursors and also reduce excessive sediment in surface water by reducing uncontrolled sediment transport. Planned grades will include all dips and water bars. If clearing and grubbing of land in the alignment area is required, use Land Clearing (460). Pipe culverts installed as part of access road should be covered by either Structures for Water Control (587) or Stream Crossings (578) depending on the type of structure. Earthfill embankment above the culvert structure would still be covered by this Practice. Diversions constructed as part of access road should be covered by Diversion (362). Dust control must be addressed under Dust Control on Unpaved Roads and Surfaces (373), or Critical Area Planting (342) where a larger area of seeding is needed.

Feature Measure: Length of Roadway

Scenario Unit: Feet

Scenario Typical Size: 500.00

Scenario Total Cost: $16,366.13

Scenario Cost/Unit: $32.73

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.45	371	$1,279.95
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	15	$1,174.50
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.61	0.11	$0.84
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	22	$631.62
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	15	$601.95
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	100	$3,036.00
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	6.9	$4.69
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.81	6.9	$5.59
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	6.9	$4.69
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$26.18	0.23	$6.02
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$23.32	257	$5,993.24
Geotextile, non-woven, heavy weight	1210	Non-woven greater than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	$1.89	850	$1,606.50
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$47.76	0.11	$5.25

Mobilization

Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 560 - Access Road

Scenario: #6 - Gravel over Base Course over Sand Filter

Scenario Description:

Newly Constructed gravel road with min. 4 inch thick compacted gravel surface over 8' base course of graded rock over 6' sand and gravel in poorly drained areas. A properly constructed, well defined access road will address resource concerns related with compaction, emissions of fugitive dust, and excessive sediment in surface water. Short term air quality deterioration may result if proper dust control measures are not implemented during the practice installation. Costs include some earthfill, shaping, grading, surface material, some seeding including the equipment, labor and materials necessary to install the practices.

Before Situation:

An agricultural enterprise which requires, but does not have, a fixed travelway for equipment and vehicles for various resource activities and where use of equipment and vehicles within the enterprise without a defined access road would result in compaction, excessive sediment and turbidity in surface water, reduced visibility, and emissions of fugitive dust. This scenario is applicable where the resource activity areas consist of relatively dry lands with steep slopes.

After Situation:

The road will be 14 feet wide with 4 inch fine gravel surfacing over 8' base course of graded rock over a 6' sand/gravel filter and 5 feet of seeding along both sides of the road. It is mostly in embankment less than 2 feet in height, (average 18 inches) typical side slopes 2:1. A properly constructed, well defined access road will greatly reduce sheet, rill and wind erosion, eliminate compaction in land use areas where it is harmful, reduce emissions of particulate matter (PM) and PM precursors and also reduce excessive sediment in surface water by reducing uncontrolled sediment transport. Planned grades will include all dips and water bars. If clearing and grubbing of land in the alignment area is required, use Land Clearing (460). Pipe culverts installed as part of access road should be covered by either Structures for Water Control (587) or Stream Crossings (578) depending on the type of structure. Earthfill embankment above the culvert structure would still be covered by this Practice. Diversions constructed as part of access road should be covered by Diversion (362). Dust control must be addressed under Dust Control on Unpaved Roads and Surfaces (373), or Critical Area Planting (342) where a larger area of seeding is needed.

Feature Measure: Length of Roadway

Scenario Unit: Feet

Scenario Typical Size: 500.00

Scenario Total Cost: $17,961.40

Scenario Cost/Unit: $35.92

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	17	$1,331.10
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.61	0.11	$0.84
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	6	$172.26
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	17	$682.21
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	294	$8,925.84
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	6.9	$4.69
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.81	6.9	$5.59
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	6.9	$4.69
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$26.18	0.23	$6.02
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$23.32	227	$5,293.64
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$47.76	0.11	$5.25
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 560 - Access Road

Scenario: #7 - Gravel Over Geogrid

Scenario Description:

Newly Constructed gravel road with min. 12 inches thick compacted gravel surface over geogrid in poorly drained areas with soft soils. A properly constructed, well defined access road will address resource concerns related with compaction, emissions of fugitive dust, and excessive sediment in surface water. Short term air quality deterioration may result if proper dust control measures are not implemented during the practice installation. Costs include some earthfill, shaping, grading, surface material, some seeding, including the equipment, labor and materials necessary to install the practices.

Before Situation:

An agricultural enterprise with an existing access road which is beyond its useful lifespan, can no longer be used as intended without rehabilitation. If left in its current condition , it will result in continued compaction, excessive sediment in surface water and emissions of fugitive dusts. This scenario is applicable where the resource activity areas with an existing but dilapidated access road consist of relatively wet and swampy or steep terrain lands where erosion is prevalent. Rock for a base course is not available or costly because of shipping, so geogrid is used in it's place.

After Situation:

The road will be 14 feet wide with 12 inch gravel surfacing over geogrid. It is mostly in embankment less than 2 feet in height, (average 12 inches) typical side slopes 2:1 and 5 feet of seeding along both sides of the road. A properly constructed, well defined access road will greatly reduce sheet, rill and wind erosion, eliminate compaction in land use areas where it is harmful, reduce emissions of particulate matter (PM) and PM precursors and also reduce excessive sediment in surface water by reducing uncontrolled sediment transport. Planned grades will include all dips and water bars. If clearing and grubbing of land in the alignment area is required, use Land Clearing (460). Pipe culverts installed as part of access road should be covered by either Structures for Water Control (587) or Stream Crossings (578) depending on the type of structure. Earthfill embankment above the culvert structure would still be covered by this Practice. Diversions constructed as part of access road should be covered by Diversion (362). Dust control must be addressed under Dust Control on Unpaved Roads and Surfaces (373), or Critical Area Planting (342) where a larger area of seeding is needed.

Feature Measure: Length of Roadway

Scenario Unit: Feet

Scenario Typical Size: 500.00

Scenario Total Cost: $23,387.39

Scenario Cost/Unit: $46.77

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.45	174	$600.30
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	13	$1,017.90
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.61	0.11	$0.84
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	14	$401.94
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	13	$521.69
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	326	$9,897.36
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	6.9	$4.69
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.81	6.9	$5.59
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	6.9	$4.69
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$26.18	0.23	$6.02
Geonet	1778	Geosynthetic drainage liner, typically HDPE of 300 mil thickness. Includes materials and shipping only.	Square Yard	$9.86	903	$8,903.58
Introduced Perennial Grasses, Legumes and/or Forbs, Medium Density	2748	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Includes material and shipping.	Acres	$68.23	0.11	$7.51
Mobilization						

Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 560 - Access Road

Scenario: #37 - Gravel over General Coarse Subgrade

Scenario Description:

Newly Constructed gravel road with min. 6 inch thick compacted gravel surface in addition to a min. 6 inch thick compacted ungraded coarse material with less than 12 percent fines in moderately well drained areas. A properly constructed, well defined access road will address resource concerns related with compaction, emissions of fugitive dust, and excessive sediment in surface water. Short term air quality deterioration may result if proper dust control measures are not implemented during the practice installation. Costs include earthfill, excavation, shaping, grading, surface material, seeding and all equipment, labor and incidental materials necessary to install the practices.

Before Situation:

An agricultural enterprise which requires, but does not have an adequate fixed travel way for equipment and vehicles for various resource activities and where use of equipment and vehicles within the enterprise without a defined access road would result in compaction, excessive sediment and turbidity in surface water, reduced visibility emissions of fugitive dust or inability to carry out resource conserving activities. This scenario is applicable where the resource activity areas consist of well to moderately well drained soils.

After Situation:

The road will be 14 feet wide with 6 inch gravel surfacing at the top, a subgrade of 6 inches of coarse material with less than 12 percent fines, and 5 feet of seeding along both sides of the road. It is mostly in embankment less than 1.5 feet in height, (average 1 ft) typical side slopes 2:1. A properly constructed, well defined access road will greatly reduce sheet, rill and wind erosion, eliminate compaction in land use areas where it is harmful, reduce emissions of particulate matter (PM) and PM precursors and also reduce excessive sediment in surface water by reducing uncontrolled sediment transport. Planned grades will include all dips and water bars. If clearing and grubbing of land in the alignment area is required, use Land Clearing (460) or Obstruction Removal (500). Pipe culverts installed as part of access road should be covered by either Structures for Water Control (587) or Stream Crossings (578) depending on the type of structure. Earthfill embankment above the culvert structure would still be covered by this Practice. Diversions constructed as part of access road should be covered by Diversion (362). Dust control must be addressed under Dust Control on Unpaved Roads and Surfaces (373).

Feature Measure: Length of access road

Scenario Unit: Linear Feet

Scenario Typical Size: 500.00

Scenario Total Cost: $8,775.73

Scenario Cost/Unit: $17.55

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	129	$517.29
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	0.11	$1.64
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.61	0.11	$0.84
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	0.11	$2.45
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$10.18	0.11	$1.12
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	139	$4,220.04
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	6.9	$4.69
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.81	6.9	$5.59
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	6.9	$4.69
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$26.18	0.23	$6.02
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$23.32	139	$3,241.48
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$47.76	0.11	$5.25
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 561 - Heavy Use Area Protection

Scenario: #1 - Rock/Gravel Surfacing Without Geotextile (Includes Hoof Contact Gravel & Rock)

Scenario Description:

Rock Surfacing, Firm Foundation (No Geotextile). Typical site is 50' X 100' for cattle lots, barn yards, and/or vegetable and fruit packing/loading areas, pads under and around watering facilities, stream access for livestock watering. Typical material is 9 to 10 inches of stone mix and/or gravel. Address Soil Erosion and Water Quality Degradation resource concerns. Also, use this scenario for Animal Access for somewhat poorly drained soils.

Before Situation:

This practice applies to agricultural, urban, recreational and other frequently and/or intensively used areas requiring treatment to address soil erosion and water quality degradation. Area identified has a firm foundation with an erosion/water quality resource concerns due to heavy animal or vehicle use.

After Situation:

The site has be stablized with the grading, shaping, and installation of rock surfacing where treatment was needed. The site is protected from further erosion. Typical site is 50' X 100' for cattle lots, barn yards, and/or vegetable and fruit packing/loading areas, pads under and around watering facilities, stream access for livestock watering. Typical material is 9 to 10 inches of stone mix and/or gravel. Typical installation includes site preparation with shaping of the site with a small dozer with on site disposal of material. All needed roads must use Access Road (560). Any needed treatment of stream crossings must use Stream Crossing (578). Any needed vegetation of disturbed areas must use Critical Area Planting (342). Provisions to collect, store, utilize, and or treat contaminated runoff must use Sediment Basin (350), Waste Storage Facility (313), or Waste Treatment (629) as appropriate. To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Windbreak/Shelterbelt Establishment (380) or Herbaceous Wind Barriers (603). Other associated pracitices are: Agrichemical Handling Facility (309) , Composting Facility(317), Watering Facility (614), Waste Transfer (633), Aquacultural Ponds (397), Prescribed Grazing (528), Livestock Pipeline (516).

Feature Measure: Area

Scenario Unit: Square Feet

Scenario Typical Size: 5,000.00

Scenario Total Cost: $6,688.97

Scenario Cost/Unit: $1.34

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	8	$626.40
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	10.5	$301.46
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	8	$321.04
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	154	$4,675.44
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 561 - Heavy Use Area Protection

Scenario: #2 - Rock/Gravel on Geotextile, Small

Scenario Description:

Rock Surfacing with Geotextile. Typical site is 20' X 24' for vegetable and fruit packing/loading areas, pads under and around watering facilities, and access aprons to various practices. Typical installation includes site preparation with shaping of the site with a small backhoe with on site disposal of material, site, material is installed using geotextile and 9 to 10 inches of stone mix and/or gravel. Address Soil Erosion and Water Quality Degradation resource concerns.

Before Situation:

This practice applies to agricultural, urban, recreational and other frequently and/or intensively used areas requiring treatment to address soil erosion and water quality degradation. Area identified has a soft foundation with an erosion/water quality resource concerns due to heavy animal or vehicle use.

After Situation:

The site has be stabilized with the grading, shaping, and installation of geotextile and rock surfacing where treatment was needed. The site is protected from further erosion. Typical site is 20' X 24' for vegetable and fruit packing/loading areas, pads under and around watering facilities, and access aprons to various practices. Typical installation includes site preparation with shaping of the site with a small dozer with on site disposal of material, site, material is installed using geotextile and 9 to 10 inches of stone mix and/or gravel. All needed roads must use Access Road (560). Any needed treatment of stream crossings must use Stream Crossing (578). Any needed vegetation of disturbed areas must use Critical Area Planting (342). Provisions to collect, store, utilize, and or treat contaminated runoff must use Sediment Basin (350), Waste Storage Facility (313), or Waste Treatment (629) as appropriate. To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Windbreak/Shelterbelt Establishment (380) or Herbaceous Wind Barriers (603). Other associated practices: Agrichemical Handling Facility (309), Composting Facility (317), Watering Facility (614), Waste Transfer (633), Aquacultural Ponds (397), Prescribed Grazing (528), Livestock Pipeline (516).

Feature Measure: Area of Rock and or Gravel

Scenario Unit: Square Feet

Scenario Typical Size: 480.00

Scenario Total Cost: $2,057.38

Scenario Cost/Unit: $4.29

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	3	$198.54
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	5	$143.55
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	3	$120.39
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	14.8	$449.33
Geotextile, non-woven, heavy weight	1210	Non-woven greater than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	$1.89	70	$132.30
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Aggregate, Shipping, Cubic Yard-mile	2360	Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul).	Cubic Yard Mile	$0.42	592	$248.64

Practice: 561 - Heavy Use Area Protection

Scenario: #3 - Rock/Gravel on Geotextile (LSR)

Scenario Description:

Rock Surfacing with Geotextile. Typical site is 50' X 100' for cattle lots, barn yards, and/or vegetable and fruit packing/loading areas, pads under and around watering facilities, stream access for livestock watering. Typical installation includes site preparation with shaping of the site with a small dozer with on site disposal of material, site, material is installed using geotextile and 9 to 10 inches of stone mix and/or gravel. Address Soil Erosion and Water Quality Degradation resource concerns.

Before Situation:

This practice applies to agricultural, urban, recreational and other frequently and/or intensively used areas requiring treatment to address soil erosion and water quality degradation. Area identified has a soft foundation with an erosion/water quality resource concerns due to heavy animal or vehicle use.

After Situation:

The site has be stabilized with the grading, shaping, and installation of geotextile and rock surfacing where treatment was needed. The site is protected from further erosion. Typical site is 50' X 100' for cattle lots, barn yards, and/or vegetable and fruit packing/loading areas, pads under and around watering facilities, stream access for livestock watering. Typical installation includes site preparation with shaping of the site with a small dozer with on site disposal of material, site, material is installed using geotextile and 9 to 10 inches of stone mix and/or gravel. All needed roads must use Access Road (560). Any needed treatment of stream crossings must use Stream Crossing (578). Any needed vegetation of disturbed areas must use Critical Area Planting (342). Provisions to collect, store, utilize, and or treat contaminated runoff must use Sediment Basin (350), Waste Storage Facility (313), or Waste Treatment (629) as appropriate. To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Windbreak/Shelterbelt Establishment (380) or Herbaceous Wind Barriers (603). Other associated practices: Agrichemical Handling Facility (309), Composting Facility (317), Watering Facility (614), Waste Transfer (633), Aquacultural Ponds (397), Prescribed Grazing (528), Livestock Pipeline (516).

Feature Measure: Area of Rock and or Gravel

Scenario Unit: Square Feet

Scenario Typical Size: 5,000.00

Scenario Total Cost: $8,633.60

Scenario Cost/Unit: $1.73

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	154	$617.54
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	8	$626.40
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	14	$401.94
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	8	$321.04
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	154	$4,675.44
Geotextile, non-woven, heavy weight	1210	Non-woven greater than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	$1.89	649	$1,226.61
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 561 - Heavy Use Area Protection

Scenario: #4 - Asphalt Pavement

Scenario Description:

The stabilization of areas around facilities that are frequently and intensively used by people, animals or vehicles by surfacing with bituminous concrete to provide a stable, non-eroding surface. Typical site is 50' X 100' for cattle lots, barn yards, and/or veg and fruit packing/loading areas driven on by heavy equipment. Typical material is 4 inches of bituminous concrete over 12 inches of gravel. Address Soil Erosion and Water Quality Degradation resource concerns.

Before Situation:

This practice applies to agricultural, urban, recreational and other frequently and/or intensively used areas requiring treatment to address soil erosion and water quality degradation. Area identified has a firm foundation with an erosion/water quality resource concerns due to heavy animal or vehicle use.

After Situation:

The installed bituminous concrete surfacing stabilizes and protects the site from further erosion and facilitates the removal of manure. The degradation of soil and water quality have been stopped. Typical site is 50' X 100' for cattle lots, barn yards, and/or veg and fruit packing/loading areas, pads under and around watering facilities. Typical material is 4 inches of bituminous concrete over 12 inches of gravel. All needed roads must use Access Road (560). Any needed treatment of stream crossings must use Stream Crossing (578). Any needed vegetation of disturbed areas must use Critical Area Planting (342). Provisions to collect, store, utilize, and or treat contaminated runoff must use Sediment Basin (350), Waste Storage Facility (313), or Waste Treatment (629) as appropriate. To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Windbreak/Shelterbelt Establishment (380) or Herbaceous Wind Barriers (603).

Feature Measure: Area of Bituminous Pavement

Scenario Unit: Square Feet

Scenario Typical Size: 5,000.00

Scenario Total Cost: $20,794.04

Scenario Cost/Unit: $4.16

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	185.2	$742.65
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	10	$783.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	11	$315.81
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	5	$200.65
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	185.2	$5,622.67
Asphalt, pavement	1867	Bituminous Concrete,includes materials, equipment and labor for 4 inch layer, base not included.	Square Feet	$2.32	5000	$11,600.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 561 - Heavy Use Area Protection

Scenario: #5 - Concrete Flatwork, 5 inches thick, Small

Scenario Description:

The stabilization of areas around facilities that are frequently and intensively used by people, animals or vehicles by surfacing with non-reinforced concrete to provide a stable, non-eroding surface. Typical concrete volume is 10 CY or less, when small size increases unit cost. Typical site is 20' X 24' concrete footprint area for vegetable and fruit packing/loading areas, pads under and around watering facilities, and access aprons in front of various practices. Typical material is 5 inches of concrete (Plain or Reinforced) over 4 to 6 inches of sand and/or gravel. Address Soil Erosion and Water Quality Degradation resource concerns. For FY2015, the cost of plain versus reinforced concrete flatwork did not differ enough to warrant having both plain and reinforced flatwork scenarios. Therefore, use this scenario even if reinforcing is required in the flatwork.

Before Situation:

This practice applies to agricultural, urban, recreational and other frequently and/or intensively used areas requiring treatment to address soil erosion and water quality degradation. Area identified is typically a feedlot/barnyard area with bare soil that creates erosion/water quality resource concerns due to animal or vehicle use. Area identified has a firm foundation with an erosion/water quality resource concerns due to heavy animal or vehicle use.

After Situation:

The installed concrete surfacing stabilizes and protects the site from further erosion and facilitates the removal of manure. The degradation of soil and water quality have been stopped. Typical site is 20' X 24' for vegetable and fruit packing/loading areas, pads under and around watering facilities, and access aprons in front of various practices. Typical material is 5 inches of concrete (Plain or Reinforced) over 4 to 6 inches of sand and/or gravel. Any needed vegetation of disturbed areas must use Critical Area Planting (342). Provisions to collect, store, utilize, and or treat contaminated runoff must use Sediment Basin (350), Waste Storage Facility (313), or Waste Treatment (629) as appropriate. To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Windbreak/Shelterbelt Establishment (380) or Herbaceous Wind Barriers (603). Other associated practices: Agrichemical Handling Facility (309), Composting Facility (317), Watering Facility (614), Waste Transfer (633), Aquacultural Ponds (397), Prescribed Grazing (528), Livestock Pipeline (516).

Feature Measure: Concrete Surface Area

Scenario Unit: Square Feet

Scenario Typical Size: 480.00

Scenario Total Cost: $4,800.66

Scenario Cost/Unit: $10.00

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	12.5	$78.13
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	4	$264.72
Concrete, CIP, Slab on Grade, non reinforced	1225	Non reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$309.79	7.4	$2,292.45
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	4	$114.84
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	4	$160.52
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	12.5	$360.75
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 561 - Heavy Use Area Protection

Scenario: #6 - Concrete Flatwork, 5 inches thick, no wall

Scenario Description:

The stabilization of areas around facilities that are frequently and intensively used by people, animals or vehicles by surfacing with concrete to provide a stable, non-eroding surface. Typical site is 50' X 100' concrete footprint area for cattle lots, barn yards, and/or veg and fruit packing/loading areas, pads under and around watering facilities. Typical material is 5 inches of concrete over 4 to 6 inches of sand and/or gravel. Address Soil Erosion and Water Quality Degradation resource concerns.

Before Situation:

This practice applies to agricultural, urban, recreational and other frequently and/or intensively used areas requiring treatment to address soil erosion and water quality degradation. Area identified is typically a feedlot/barnyard area with bare soil that creates erosion/water quality resource concerns due to animal or vehicle use. Area identified has a firm foundation with an erosion/water quality resource concerns due to heavy animal or vehicle
use.

After Situation:

The installed concrete surfacing stabilizes and protects the site from further erosion and facilitates the removal of manure. The degradation of soil and water quality have been stopped. Typical site is 50' X 100' for cattle lots, barn yards, and/or veg and fruit packing/loading areas, pads under and around watering facilities. Typical material is 5 inches of concrete over 4 to 6 inches of sand and/or gravel. Any needed vegetation of disturbed areas must use Critical Area Planting (342). Provisions to collect, store, utilize, and or treat contaminated runoff must use Sediment Basin (350), Waste Storage Facility (313), or Waste Treatment (629) as appropriate. To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Windbreak/Shelterbelt Establishment (380) or Herbaceous Wind Barriers (603). Other associated practices: Agrichemical Handling Facility (309), Composting Facility (317), Watering Facility (614), Waste Transfer (633), Aquacultural Ponds (397), Prescribed Grazing (528), Livestock Pipeline (516), (319) On-Farm Secondary Containment.

Feature Measure: Area of Concrete Surface

Scenario Unit: Square Feet

Scenario Typical Size: 5,000.00

Scenario Total Cost: $44,347.64

Scenario Cost/Unit: $8.87

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	77.2	$38,696.50
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	104	$417.04
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	4	$313.20
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	4	$160.52
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	104	$3,001.44
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 561 - Heavy Use Area Protection

Scenario: #7 - Concrete Flatwork, 5 inches thick, 1 foot tall R/C Wall

Scenario Description:

Concrete Flatwork w/1' Reinforced Concrete Wall. Typical site is 100' X 50' concrete footprint area. Typical material is 5 inches of concrete over 6 inches of sand and gravel with 200' long, 1 foot high, reinforced concrete wall (100' each on the 2 long sides), of the concrete pad to facilitate cleaning of pad. This is typically used between a barn/feedlot and a Waste Storage Facility.

Before Situation:

Area identified is typically a feedlot/barnyard area with bare soil that creates erosion/water quality resource concerns due to animal or vehicle use.

After Situation:

The installed concrete surfacing and wall stabilizes and protects the site from further erosion and facilitates the removal of manure. Manure is contained and handled in a manner that stops runoff and degradation of the soil and water at the headquarters site. Typical site is 100' X 50' concrete footprint area. Typical material is 5 inches of concrete over 6 inches of sand and gravel with a 200' long (100' each on the 2 long sides) , 2 foot high, reinforced concrete wall to facilitate cleaning of pad. This is typically used between a barn/feedlot and a Waste Storage Facility. Other associated practices are: Composting Facility (317), Waste Transfer (633), Waste Storage Facility (313), Critical Area Planting (342), Mulching (484).

Feature Measure: Footprint of Concrete Area

Scenario Unit: Square Feet

Scenario Typical Size: 5,000.00

Scenario Total Cost: $49,954.21

Scenario Cost/Unit: $9.99

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	68.7	$34,435.88
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	17.4	$9,867.19
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	104	$417.04
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	4	$313.20
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	4	$160.52
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	104	$3,001.44
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 561 - Heavy Use Area Protection

Scenario: #8 - Concrete Flatwork, 5 inches thick, 2 foot tall R/C Wall

Scenario Description:

Concrete Flatwork w/2' Reinforced Concrete Wall. Typical site is 50' X 100' concrete footprint area. Typical material is 5 inches of concrete over 6 inches of sand and gravel with a 200' long, 2 foot high, reinforced concrete wall (100' each on the 2 long sides) to facilitate cleaning of pad. This is typically used around barns, feedlots and Waste Storage Facilities.

Before Situation:

Area identified is typically a feedlot/barnyard area with bare soil that creates erosion/water quality resource concerns due to animal or vehicle use.

After Situation:

The installed concrete surfacing and wall stabilizes and protects the site from further erosion and facilitates the removal of manure. The degradation of soil and water quality have been stopped. Typical site is 50' X 100' concrete footprint area. Typical material is 5 inches of concrete over 6 inches of sand and gravel with a 200' long (100' each on the 2 long sides) , 2 foot high, reinforced concrete wall to facilitate cleaning of pad. This is typically used around barns and feedlots. Other associated practices are: Composting Facility (317), Waste Transfer (633), Waste Storage Facility (313), Critical Area Planting (342), Mulching (484) .

Feature Measure: Footprint of Concrete Area

Scenario Unit: Square Feet

Scenario Typical Size: 5,000.00

Scenario Total Cost: $54,804.29

Scenario Cost/Unit: $10.96

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	64.8	$32,481.00
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	29.4	$16,672.15
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	104	$417.04
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	4	$313.20
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	4	$160.52
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	104	$3,001.44
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 561 - Heavy Use Area Protection

Scenario: #9 - Liquid Tight Reinforced Concrete Flatwork

Scenario Description:

The stabilization of areas around facilities that are frequently and intensively used by people, animals or vehicles by surfacing with reinforced concrete to provide a stable, non-eroding surface. Typical site is 200'x200' for feed storage areas driven on by heavy equipment. Typical material is 6 inches of reinforced concrete over 4 to 6 inches of sand and/or gravel with waterstops and slip dowels at joints on 100 ft spacing. Address Soil Erosion and Water Quality Degradation resource concerns.

Before Situation:

This practice applies to agricultural, urban, recreational and other frequently and/or intensively used areas requiring treatment to address soil erosion and water quality degradation. Area identified has a firm foundation with an erosion/water quality resource concerns due to heavy animal or vehicle use.

After Situation:

The installed concrete surfacing stabilizes and protects the site from further erosion and facilitates the storage/removal of feed/silage. The degradation of soil and water quality have been stopped. Typical site is 200'x200' for feed storage areas driven on by heavy equipment. Typical material is 6 inches of reinforced concrete over 4 to 6 inches of sand and/or gravel with waterstops and slip dowels at joints on 100 ft spacing. Concrete is 9 inches thick at the water tight joints. All needed roads must use Access Road (560). Any needed vegetation of disturbed areas must use Critical Area Planting (342). Provisions to collect, store, utilize, and or treat contaminated runoff must use Sediment Basin (350), Waste Storage Facility (313), or Waste Treatment (629) as appropriate. To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Windbreak/Shelterbelt Establishment (380) or Herbaceous Wind Barriers (603). Other associated practices: Agrichemical Handling Facility (309), Composting Facility (317), Watering Facility (614), Waste Transfer (633), Aquacultural Ponds (397), Prescribed Grazing (528), Livestock Pipeline (516).

Feature Measure: Area of Reinforced Concrete

Scenario Unit: Square Feet

Scenario Typical Size: 40,000.00

Scenario Total Cost: $409,044.74

Scenario Cost/Unit: $10.23

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	745	$373,431.25
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	741	$2,971.41
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	32	$2,505.60
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	40	$1,148.40
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	32	$1,284.16
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	741	$21,385.26
Waterstop, PVC, ribbed, 3/16 in x 6 in	1614	Waterstop, PVC, ribbed, 3/16 inch thick by 6 inches wide. Includes materials, equipment and labor.	Feet	$7.58	400	$3,032.00
Concrete joint slip joint	2375	Concrete joint slip dowel, # 6 rebar, 18 inch with a 9 inch plastic sleeve. Materials only.	Each	$4.35	404	$1,757.40
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 561 - Heavy Use Area Protection

Scenario: #13 - Geogrid

Scenario Description:

Newly constructed gravel heavy use area protection with minimum 12 inch thick compacted surface over geogrid over non woven geotextile in poorly drained areas. Typical site is 50' X 100' for cattle lots, barn yards, and/or vegetable and fruit packing/loading areas, pads under and around watering facilities, stream access for livestock watering. Typical installation includes site preparation with shaping of the site with a small dozer with on site disposal of material, site, material is installed using geotextile, geogrid, and 12 inches of stone mix and/or gravel. Address Soil Erosion and Water Quality Degradation resource concerns. Costs include earthfill, excavation, shaping, grading, geotextile, geogrid, surface material, seeding and all equipment, labor and incidental materials necessary to install the practice.

Before Situation:

This practice applies to agricultural, urban, recreational and other frequently and/or intensively used areas requiring treatment to address soil erosion and water quality degradation. Area identified has a soft foundation with an erosion/water quality resource concerns due to heavy animal or vehicle use. Rock for a base course is not available or costly because of shipping, so geogrid is used in it's place.

After Situation:

The site has be stabilized with the grading, shaping, and installation of geotextile, geogrid and rock surfacing where treatment was needed. The site is protected from further erosion. Typical site is 50' X 100' for cattle lots, barn yards, and/or vegetable and fruit packing/loading areas, pads under and around watering facilities, stream access for livestock watering. Typical installation includes site preparation with shaping of the site with a small dozer with on site disposal of material, site, material is installed using geotextile, geogrid and 12 inches of stone mix and/or gravel. All needed roads must use Access Road (560). Any needed treatment of stream crossings must use Stream Crossing (578). Any needed vegetation of disturbed areas must use Critical Area Planting (342). Provisions to collect, store, utilize, and or treat contaminated runoff must use Waste Separation Facility (632), Waste Transfer (634), Waste Storage Facility (313), or Waste Treatment (629) as appropriate. To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Windbreak/Shelterbelt Establishment (380) or Herbaceous Wind Barriers (603). Other associated practices: Agrichemical Handling Facility (309), Composting Facility (317), Watering Facility (614), Waste Transfer (633), Aquacultural Ponds (397), Prescribed Grazing (528), Livestock Pipeline (516).

Feature Measure: Area of Heavy Use Area Protecton

Scenario Unit: Square Feet

Scenario Typical Size: 5,000.00

Scenario Total Cost: $24,410.36

Scenario Cost/Unit: $4.88

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	204	$818.04
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	10	$783.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	15	$430.65
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	10	$401.30
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	204	$6,193.44
Geotextile, non-woven, heavy weight	1210	Non-woven greater than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	$1.89	649	$1,226.61
Turf reinforcement mat	1212	Synthetic turf reinforcement mat with staple anchoring. Includes materials, equipment and labor.	Square Yard	$9.50	649	$6,165.50
Geonet	1778	Geosynthetic drainage liner, typically HDPE of 300 mil thickness. Includes materials and shipping only.	Square Yard	$9.86	696	$6,862.56
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 561 - Heavy Use Area Protection

Scenario: #16 - 1 foot tall R/C Wall, Doweled into Slab

Scenario Description:

1' Reinforced Concrete Wall or curb with 2'-6' footer formed and doweled to an existing concrete slab. Typical site is 100' of curbing needed for lot size reduction in order to reduce the surface area exposed to animal manure . Material includes 6 inch concrete footer over 6 inches of sand and gravel. This would be used where a modification is needed to an existing concrete lot area in order to reduce the lot size and reduce the polluted runoff area. The wall or curb will protect the edges of the existing concrete slab from soil erosion and improve water quality.

Before Situation:

Area identified is typically an existing concrete feedlot/barnyard area with erosion and water quality resource concerns due to animal use and site runoff.

After Situation:

The existing lot size is reduced in size which will reduce the volume of polluted runoff. A 1ft reinforced concrete wall/curb is installed that is doweled into the existing lot concrete to stabilize the edge of the existing concrete lot slab and protect the site from further erosion due to lot runoff thereby improving water quality. The wall/curb will also aid in facilitating the removal of manure from the lot area. Typical site is 100' R/C wall/curb with 2ft-6inch footer and doweled into an existing concrete slab, 0.067 cy of concrete per liner foot of wall/curb. Typical material is 6 inches of concrete over 6 inches of sand and gravel. Other associated practices are: Composting Facility (317), Waste Transfer (633), Waste Storage Facility (313), Vegetative Treatment Area (635), Waste Treatment (629)

Feature Measure: linear feet of curbing

Scenario Unit: Linear Feet

Scenario Typical Size: 100.00

Scenario Total Cost: $5,032.23

Scenario Cost/Unit: $50.32

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	6.7	$3,358.38
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	7	$43.75
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	3	$198.54
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	12	$344.52
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	3	$120.39
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	7	$202.02
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 561 - Heavy Use Area Protection

Scenario: #18 - Concrete Flatwork Fiber reinforced, 5 inches thick, no wall

Scenario Description:

The stabilization of areas around facilities that are frequently and intensively used by people, animals or vehicles by surfacing with reinforced concrete to provide a stable, non-eroding surface. Typical site is 50' X 100' concrete footprint area for cattle lots, barn yards, and/or veg and fruit packing/loading areas, pads under and around watering facilities. Typical material is 5 inches of concrete (Plain or Reinforced) over 4 to 6 inches of sand and/or gravel. Address Soil Erosion and Water Quality Degradation resource concerns

Before Situation:

This practice applies to agricultural, urban, recreational and other frequently and/or intensively used areas requiring treatment to address soil erosion and water quality degradation. Area identified is typically a feedlot/barnyard area with bare soil that creates erosion/water quality resource concerns due to animal or vehicle use. Area identified has a firm foundation with an erosion/water quality resource concerns due to heavy animal or vehicle use.

After Situation:

The installed concrete surfacing stabilizes and protects the site from further erosion and facilitates the removal of manure. The degradation of soil and water quality have been stopped. Typical site is 50' X 100' for cattle lots, barn yards, and/or veg and fruit packing/loading areas, pads under and around watering facilities. Typical material is 5 inches of concrete (Reinforced) over 4 to 6 inches of sand and/or gravel. Any needed vegetation of disturbed areas must use Critical Area Planting (342). Provisions to collect, store, utilize, and or treat contaminated runoff must use Sediment Basin (350), Waste Storage Facility (313), or Waste Treatment (629) as appropriate. To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Windbreak/Shelterbelt Establishment (380) or Herbaceous Wind Barriers (603). Other associated practices: Agrichemical Handling Facility (309), Composting Facility (317), Watering Facility (614), Waste Transfer (633), Aquaculture Ponds (397), Prescribed Grazing (528), Livestock Pipeline (516), (319) On-Farm Secondary Containment.

Feature Measure: Area of Concrete Surface

Scenario Unit: Square Feet

Scenario Typical Size: 5,000.00

Scenario Total Cost: $29,062.81

Scenario Cost/Unit: $5.81

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	104	$417.04
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	4	$313.20
Concrete, CIP, Slab on Grade, fiber reinforced	2001	Fiber reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$303.26	77.2	$23,411.67
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	4	$160.52
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	104	$3,001.44
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 561 - Heavy Use Area Protection

Scenario: #75 - Rock/Gravel Surfacing Without Geotextile (Includes Hoof Contact Gravel &Rock) Small

Scenario Description:

Rock Surfacing, Soft Foundation (No Geotextile). Typical site is 20' X 20' for cattle lots, barn yards, pads under and around watering facilities, stream access for livestock watering. Typical material is 18 to 28 inches of stone mix and/or gravel. Address Soil Erosion and Water Quality Degradation resource concerns. Also, use this scenario for Animal Access for somewhat poorly drained soils.

Before Situation:

This practice applies to agricultural, urban, recreational and other frequently and/or intensively used areas requiring treatment to address soil erosion and water quality degradation. Area identified has a soft foundation with an erosion/water quality resource concerns due to heavy animal or vehicle use.

After Situation:

The site has be stabilized with the grading, shaping, and installation of rock surfacing where treatment was needed. The site is protected from further erosion. Typical site is 20' X 20' for cattle lots, barn yards, pads under and around watering facilities, stream access for livestock watering. Typical material is 18 to 28 inches of stone mix and/or gravel. Typical installation includes site preparation with shaping of the site with a small dozer with on-site disposal of material. All needed roads must use Access Road (560). Any needed treatment of stream crossings must use Stream Crossing (578). Any needed vegetation of disturbed areas must use Critical Area Planting (342). Provisions to collect, store, utilize, and or treat contaminated runoff must use Sediment Basin (350), Waste Storage Facility (313), or Waste Treatment (629) as appropriate. To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Windbreak/Shelterbelt Establishment (380) or Herbaceous Wind Barriers (603). Other associated practices are: Agrichemical Handling Facility (309), Composting Facility (317), Watering Facility (614), Waste Transfer (633), Aquacultural Ponds (397), Prescribed Grazing (528), Livestock Pipeline (516).

Feature Measure: Area

Scenario Unit: Square Feet

Scenario Typical Size: 400.00

Scenario Total Cost: $2,348.15

Scenario Cost/Unit: $5.87

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	3	$234.90
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	5	$143.55
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	3	$120.39
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	23	$698.28
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Aggregate, Shipping, Cubic Yard-mile	2360	Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul).	Cubic Yard Mile	$0.42	920	$386.40

Practice: 561 - Heavy Use Area Protection

Scenario: #76 - Flexible Membrane - intimate contact

Scenario Description:
Installation of a flexible geosynthetic membrane liner (typically 60mil), covered with a drainage layer along with a graded rock and crushed stone surface, to improve water protection and reduce erosion from feed pads. Typical size pad is 0.5 Ac. pad. Practice implementation includes no geotextile underneath to provide direct contact with subgrade soils. A 6' drainage layer is directly above the geomembrane and then a layer of geotextile to separate the drainage layer from the surfacing material. Surfacing material is 8' of graded rock with 4' of crushed stone. Associated practices include PS313 Waste Storage Facility and PS634 Waste Transfer.

Before Situation:
In-place soils need to be protected to improve water quality and avoid erosion.

After Situation:
Water conservation and environmental protection provided by stabilizing areas that are used for feed pads.

Feature Measure: Surface area of liner materials (incl

Scenario Unit: Square Yard

Scenario Typical Size: 2,420.00

Scenario Total Cost: $119,683.85

Scenario Cost/Unit: $49.46

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$56.88	70	$3,981.60
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	40	$1,754.80
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	210	$6,029.10
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	70	$2,125.20
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	70	$3,402.00
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	20	$2,229.00
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	671	$20,371.56
Rock Riprap, graded, angular, material and shipping	1200	Graded Rock Riprap for all gradation ranges. Includes materials and local delivery within 20 miles of quarry. Placement costs are not included.	Ton	$37.44	747	$27,967.68
Geotextile, non-woven, heavy weight	1210	Non-woven greater than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	$1.89	2420	$4,573.80
Synthetic Liner, 60 mil	2109	Synthetic 60 mil HDPE, LLDPE, EPDM, etc. membrane liner material. Includes materials and shipping only.	Square Feet	$2.08	21780	$45,302.40
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	1000	$1,000.00
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 561 - Heavy Use Area Protection

Scenario: #77 - Flexible Membrane - Medium Weight

Scenario Description:
Installation of a flexible geosynthetic membrane liner (typically 40 mil), covered with a drainage layer, to improve water protection and reduce erosion from feed pads. Typical size pad is 0.5 Ac. pad. Practice implementation includes no geotextile underneath to provide direct contact with subgrade soils. A 6' drainage layer is directly above the geomembrane. Surfacing material is contracted using a separate HUAP scenario. Associated practices include PS313 Waste Storage Facility, PS634 Waste Transfer and Heavy Use Area Protection (561).

Before Situation:
In-place soils need to be protected to improve water quality and avoid erosion.

After Situation:
Water conservation and environmental protection provided by stabilizing areas that are used for feed pads.

Feature Measure: Surface area of liner materials (incl

Scenario Unit: Square Yard

Scenario Typical Size: 2,420.00

Scenario Total Cost: $46,861.65

Scenario Cost/Unit: $19.36

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$56.88	50	$2,844.00
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	40	$1,754.80
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	150	$4,306.50
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	50	$1,518.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	40	$1,944.00
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	20	$2,229.00
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	404	$12,265.44
Synthetic Liner, 40 mil	1387	Synthetic 40 mil HDPE, LLDPE, EPDM, etc membrane liner material. Includes materials and shipping only.	Square Yard	$7.46	2420	$18,053.20
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	1000	$1,000.00
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 561 - Heavy Use Area Protection

Scenario: #78 - Soil Liner, on-site material

Scenario Description:
Construction of a compacted soil layer to improve water protection and reduce erosion from feed storage pads. Practice implementation includes compaction of the soil layer under proper moisture conditions to the designed liner thickness. Material is on site. Associated practices include Waste Transfer(634), HUAP(561), Waste Storage Facility (313), and other waste water impoundment standards.

Before Situation:
In-place soils at site require transporting a short distance to act as a liner. An adequate quantity of soil suitable for constructing a soil liner is available on site, but needs to be moved and compacted.

After Situation:
Water conservation and environmental protection provided by stabilizing areas that are used for feed pads. This scenario includes a compacted liner thickness of 2.0 ft over 1.32 acre area.

Feature Measure: Cubic Yards of compacted soil liner

Scenario Unit: Cubic Yards

Scenario Typical Size: 4,260.00

Scenario Total Cost: $39,730.17

Scenario Cost/Unit: $9.33

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	4260	$17,082.60
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$100.26	48	$4,812.48
Scraper, self propelled, 21 CY	1208	Self propelled earthmoving scraper with 21 CY capacity. Does not include labor.	Hours	$296.28	40	$11,851.20
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	88	$3,531.44
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 561 - Heavy Use Area Protection

Scenario: #79 - Soil Liner, material hauled in

Scenario Description:
Construction of a compacted soil liner to improve water protection and reduce erosion from feed storage pads. Practice implementation includes compaction of the soil layer under proper moisture conditions to the designed liner thickness. Material is obtained from owned property and hauled on site. Associated practices include Waste Transfer(634), HUAP(561), Waste Storage Facility (313), and other waste water impoundment standards.

Before Situation:
In-place soils at site don't meet requirements so soil is transported from off site.

After Situation:
Water conservation and environmental protection provided by limiting seepage losses from feed pads.This scenario includes a bringing in soil from off site and compacting a liner with a thickness of 2.0 ft over 1.32 acre area.

Feature Measure: Cubic Yards of compacted soil liner

Scenario Unit: Cubic Yards

Scenario Typical Size: 4,260.00

Scenario Total Cost: $50,967.60

Scenario Cost/Unit: $11.96

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	4260	$17,082.60
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$100.26	48	$4,812.48
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hours	$145.01	40	$5,800.40
Scraper, self propelled, 21 CY	1208	Self propelled earthmoving scraper with 21 CY capacity. Does not include labor.	Hours	$296.28	40	$11,851.20
Hauling, bulk, highway truck	1615	Hauling of bulk earthfill, rockfill, waste or debris. One-way travel distance using fully loaded highway dump trucks (typically 16 CY or 20 TN capacity). Includes equipment and labor for truck only. Does not include cost for loading truck.	Cubic Yard Mile	$0.36	8520	$3,067.20
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	128	$5,136.64
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	3	$2,293.89
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 570 - Stormwater Runoff Control

Scenario: #1 - Erosion Control Measure

Scenario Description:

This scenario involves installation of erosion control practice on the construction site as part of a conservation engineering system. The erosion control will address the resource concerns related with excessive sediment in surface waters as well as protection of existing inlets and structures. The typical erosion control measure is the installation of a silt fence.

Before Situation:

The erosion control measure scenario is applicable in all construction sites and watersheds including those in the urban and suburban areas.

After Situation:

The typical erosion control measure is a silt fence. When properly installed, the erosion control measure will filter the stormwater runoff to the downstream areas. Erosion control measures are installed along the downstream perimeter of a construction site to prevent sediment transport off the construction area where soil is disturbed. A typical silt fence consists of a synthetic filter fabric stretched between a series of fence stakes, with the stakes installed on the downstream side of the perimeter and the fabric trenched into the soil on the upstream side and backfilled. If seeding is warranted for water quality and erosion control purpose, use Critical Area Planting (342).

Feature Measure: Length of erosion control practice i

Scenario Unit: Feet

Scenario Typical Size: 300.00

Scenario Total Cost: $1,225.14

Scenario Cost/Unit: $4.08

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	1.5	$38.04
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	10	$287.10
Materials						
Silt Fence	43	Silt fence with support post. Includes materials, equipment and labor	Feet	$3.00	300	$900.00

Practice: 570 - Stormwater Runoff Control

Scenario: #20 - Rain Garden, greater than 750 sqft

Scenario Description:
Typical Size: 36' x 30' area, 4-8' deep. Additional Considerations from the practice standard that would be addressed by the practice are: Design stormwater control practices to fit into the visual landscape as well as to function for runoff control. If properly designed, stormwater control practices can be beneficial to wildlife.

Before Situation:
Stormwater is managed to prevent erosion from farmstead impervious surfaces and practice standard is met

After Situation:
Stormwater is managed to prevent erosion, reduce quantity of runoff, enhance visual impact and increase wildlife habitat and/or food.

Feature Measure: square feet of rain garden

Scenario Unit: Square Feet

Scenario Typical Size: 1,080.00

Scenario Total Cost: $1,343.56

Scenario Cost/Unit: $1.24

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$56.88	2	$113.76
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	3	$76.08
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	2	$60.72
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	3	$145.80
Materials						
Straw	1237	Small grain straw (non organic and certified organic). Includes materials only.	Ton	$137.00	0.3	$41.10
Native Perennial Grasses, Legumes and/or Forb Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, moderate commercial availability	2619	Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed is moderately easy to purchase commercially. Includes materials and shipping.	Acres	$469.81	0.1	$46.98
Perennial Grass, Legume, and/or Forb Liners or Plugs, each	2758	Perennial grasses, legumes and/or forbs for small areas using vegetative propagules including liners or plugs. Includes materials and shipping.	Number	$2.17	150	$325.50
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 570 - Stormwater Runoff Control

Scenario: #38 - Rain Garden, 750 sqft or less

Scenario Description:
Typical Size: Drainage area 3750sqft. Garden size 20' x 30' area, 4-8' deep. Additional Considerations from the practice standard that would be addressed by the practice are: Design stormwater control practices to fit into the visual landscape as well as to function for runoff control. If properly designed, stormwater control practices can be beneficial to wildlife.

Before Situation:
Stormwater from farmstead impervious surfaces causes erosion and flooding

After Situation:
Stormwater is managed to prevent erosion, reduce quantity of runoff, enhance visual impact and increase wildlife habitat and/or food.

Feature Measure: sqft of rain garden

Scenario Unit: Square Feet

Scenario Typical Size: 600.00

Scenario Total Cost: $1,135.36

Scenario Cost/Unit: $1.89

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$56.88	4	$227.52
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	7	$177.52
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	5	$143.55
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	1	$48.60
Materials						
Mulching, straw or hay	1214	Use of straw or hay for temporary ground cover. Includes application and methods necessary to keep in place such as tacking or crimping. Includes materials, equipment and labor.	Acres	$3,104.31	0.02	$62.09
Native Perennial Grasses, Legumes and/or Forb Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, moderate commercial availability	2619	Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed is moderately easy to purchase commercially. Includes materials and shipping.	Acres	$469.81	0.02	$9.40
Perennial Grass, Legume, and/or Forb Liners or Plugs, each	2758	Perennial grasses, legumes and/or forbs for small areas using vegetative propagules including liners or plugs. Includes materials and shipping.	Number	$2.17	75	$162.75
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 572 - Spoil Disposal

Scenario: #1 - Spoil Spreading, wide area

Scenario Description:
A spoil pile is spread over a designated area according to an approved plan. Typical application includes spreading of spoil from pond or wetland excavations. The resource concerns are Soil Erosion and Water Quality Degradation.

Before Situation:
Spoil material is available from excavation of channels, drainage ditches, irrigation canals, ponds, or other construction sites.

After Situation:
Land has been shaped to the required elevations and grades. Resource concerns have been treated. Associated practices, like critical area planting or irrigation/drainage water management practices, would be contracted seperately as needed.

Feature Measure: Cubic yards of spoil spread

Scenario Unit: Cubic Yards

Scenario Typical Size: 1,000.00

Scenario Total Cost: $2,888.65

Scenario Cost/Unit: $2.89

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$100.26	14	$1,403.64
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	14	$561.82
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 572 - Spoil Disposal

Scenario: #3 - 412 Berm Removal less than 600ac DA

Scenario Description:
A spoil pile is spread over a designated area according to an approved plan. Typical application includes spreading of temporary berms used to help establish vegetation on grassed waterways. Typical grassed waterway is 1200 feet long with 2160 CY of spoil. Waterway width = 54', 1200' long and excavating 0.9 foot = 2160 CY. Temporary berms on grassed waterways are built out of the spoil from constructing the waterway, berms may be on one or both sides of the waterway. The resource concerns are Soil Erosion and Water Quality Degradation.

Before Situation:
Spoil material is available from excavation of grassed waterway used for temporary berms.

After Situation:
Land has been shaped to the required elevations and grades to allow runoff to flow into the waterway. Resource concerns have been treated. Associated practices, like critical area planting, would be contracted seperately as needed.

Feature Measure: Linear feet of waterway

Scenario Unit: Feet

Scenario Typical Size: 1,200.00

Scenario Total Cost: $2,748.26

Scenario Cost/Unit: $2.29

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$100.26	13	$1,303.38
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	13	$521.69
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 572 - Spoil Disposal

Scenario: #4 - 412 Berm Removal greater than 600ac DA

Scenario Description:
A spoil pile is spread over a designated area according to an approved plan. Typical application includes spreading of temporary berms used to help establish vegetation on grassed waterways. Typical grassed waterway is 1500 feet long with 4800 CY of spoil. Waterway width = 72', 1500' long and excavating 1.2 foot = 4800 CY. Temporary berms on grassed waterways are built out of the spoil from constructing the waterway, berms may be on one or both sides of the waterway. The resource concerns are Soil Erosion and Water Quality Degradation.

Before Situation:
Spoil material is available from excavation of grassed waterway used for temporary berms.

After Situation:
Land has been shaped to the required elevations and grades. Resource concerns have been treated. Associated practices, like critical area planting, would be contracted seperately as needed.

Feature Measure: Linear feet of waterway

Scenario Unit: Feet

Scenario Typical Size: 1,500.00

Scenario Total Cost: $3,730.99

Scenario Cost/Unit: $2.49

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$100.26	20	$2,005.20
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	20	$802.60
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 574 - Spring Development

Scenario: #3 - Spring Development, Horizontal Pipe with Collection Box

Scenario Description:

Develop a water source from a natural spring or seep to provide water for livestock and/or wildlife needs. This scenario includes excavating and exposing the water source at the spring/seep (typically on a hillside) and installing a horizontal water collection system and a water storage structure. The collection system is commonly composed of perforated 4 inch diameter drainage pipe placed in an excavated collection trench that runs across the slope into the collection box.Resource Concern: Livestock production limitation - Inadequate livestock water.Associated Practices: 516-Livestock Pipeline; 614-Watering Facility; 533 Pumping Plant

Before Situation:

Livestock operation with inadequate fresh water for livestock and an on-site undeveloped spring/seep.

After Situation:

Spring development system provides adequate water for the intended use. The system typically runs all year long in most zones. Water is collected in a spring box (48 inch diameter x 6 ft long CMP). Horizontal water collection system is a 50 ft long, 4 inch diameter HDPE perforated pipe enclosed in a sand/gravel envelope overlaid by 2 ft wide filter fabric (50 ft long).

Feature Measure: Number of Developments

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $5,708.27

Scenario Cost/Unit: $5,708.27

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.11	20	$22.20
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	4	$264.72
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	16	$1,058.88
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	32	$918.72
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	16	$459.36
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	16	$485.76
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	4	$121.44
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	4	$115.44
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	3	$91.08
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	4	$121.44
Spring Collection Box Cover, steel, 4 ft. diameter	1281	4 foot diameter x 1/4 inch thick Steel lid with handle for spring collection box. Materials and fabrication.	Each	$218.17	1	$218.17
Pipe, HDPE, corrugated single wall, <= 12 in. weight priced Compound	1380	High Density Polyethylene (HDPE) compound manufactured into single wall corrugated pipe or tubing. Materials only.	Pound	$2.09	16.25	$33.96
Pipe, CMP, 14-12 gauge, weight priced	1589	14 and 12 gauge galvanized helical corrugated metal pipe priced by the weight of the pipe materials. Materials only.	Pound	$0.93	288	$267.84
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 574 - Spring Development

Scenario: #4 - Spring Development, wth Collection Pipe Structure

Scenario Description:
Develop a water source from a natural spring or seep to provide water for livestock and/or wildlife needs. Typically installed at the point source of a spring and provides for collection and storage of water. Payment includes the excavation of the spring source, placement of a horizontal or vertical collection pipe and gravel around the pipe. This does not include the livestock pipeline (516) to the watering facility.Resource Concern: Livestock production limitation - Inadequate livestock water.Associated Practices: 516-Livestock Pipeline; 614-Watering Facility; 533 Pumping Plant

Before Situation:
Livestock operation with inadequate fresh water for livestock and an on-site undeveloped spring/seep.

After Situation:
Spring development system provides adequate water for the intended use. The system typically runs all year long in most zones. Water is collected in a vertical 48 inch diameter x 12 ft tall CMP.

Feature Measure: Number of Developments

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $4,125.95

Scenario Cost/Unit: $4,125.95

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	8	$529.44
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	32	$918.72
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	8	$242.88
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	5	$151.80
Spring Collection Box Cover, steel, 4 ft. diameter	1281	4 foot diameter x 1/4 inch thick Steel lid with handle for spring collection box. Materials and fabrication.	Each	$218.17	1	$218.17
Pipe, CMP, 14-12 gauge, weight priced	1589	14 and 12 gauge galvanized helical corrugated metal pipe priced by the weight of the pipe materials. Materials only.	Pound	$0.93	576	$535.68
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 574 - Spring Development

Scenario: #18 - Spring Development

Scenario Description:
Develop a water source from a natural spring or seep (i.e., spring development) to provide water for livestock and/or wildlife needs. This typical scenario includes excavating and exposing the water source at the spring/seep (typically on a hillside), constructing a water collection structure by installing a 50 ft long, 4 inch diameter HDPE perforated pipe enclosed in a sand/gravel envelope overlaid by 2 ft wide filter fabric (50 ft long) and behind a concrete cutoff wall (6 inch x 4 ft height x 25 ft long) to retain water. Water is directed (via 20 ft long, 4 inch PVC) to a spring box (48 inch diameter x 6 ft long CMP) that is located at the cutoff wall or below the wall, equipped with a watertight lid and two outlets. One outlet serves as overflow pipe to account for occasions where inflow exceeds outflow. The collection system is commonly composed of a single or a network of perforated 4 inch diameter drainage pipe placed in an excavated collection trench that runs across the slope. The outflow pipe from the spring box can be directed to buried large storage (not included), and to a watering facility (not included) for useResource Concern: Livestock production limitation - Inadequate livestock water.Associated Practices: 516-Livestock Pipeline; 614-Watering Facility; 382-Fence; Critical Area Planting (342).

Before Situation:
Livestock operation with inadequate fresh water for livestock and an on-site undeveloped spring/seep.

After Situation:
Spring development system provides adequate water for the intended use. The system typically runs all year long in most zones.

Feature Measure: Number of Developments

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $5,870.38

Scenario Cost/Unit: $5,870.38

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	2	$1,134.16
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.11	11	$12.21
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	16	$1,058.88
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	32	$918.72
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	16	$485.76
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	2	$57.72
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	2	$60.72
Spring Collection Box Cover, steel, 4 ft. diameter	1281	4 foot diameter x 1/4 inch thick Steel lid with handle for spring collection box. Materials and fabrication.	Each	$218.17	1	$218.17
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.29	40.6	$92.97
Pipe, HDPE, corrugated single wall, <= 12 in. weight priced Compound	1380	High Density Polyethylene (HDPE) compound manufactured into single wall corrugated pipe or tubing. Materials only.	Pound	$2.09	16.25	$33.96
Pipe, CMP, 14-12 gauge, weight priced	1589	14 and 12 gauge galvanized helical corrugated metal pipe priced by the weight of the pipe materials. Materials only.	Pound	$0.93	288	$267.84
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 575 - Trails and Walkways

Scenario: #1 - Raised earth walkway

Scenario Description:

Construct an earth or vegetated trail or walkway to facilitate the movement of animals, people, or off-road vehicles to provide or improve access to forage, water, working/handling facilities, and/or shelter, Improve grazing efficiency and distribution, and/or protect ecologically sensitive, erosive and/or potentially erosive sites, pedestrian or off-road vehicle access to agricultural, construction, or maintenance operations, provide trails for recreational activities or access to recreation sites and address the resource concerns of soil erosion and water quality degradation. Trails and walkways range is widths from 8ft to 12ft. Typical width of 12ft is used. Costs include shaping, grading, some earthfill including the equipment, labor and materials necessary to install the practice.

Before Situation:

This practice applies on all lands where management of animal or human movement is needed to address soil erosion and water quality resource concerns. This practice applies to trails or walkways constructed for use by off-road vehicles, such as All-Terrain Vehicles or snowmobiles, which are not designed for use on public roads. It does not apply to roads constructed for movement of equipment or vehicles. Use NRCS Conservation Practice Standard Access Road (Code 560).

After Situation:

The typical earthen trail or walkway will be a 12 foot wide 500 foot long, with a crowned surface for drainage. The crown height is 1 ft (average 0.5ft), typical side slopes 2:1. This scenario includes grading and shaping necessary to provide a smooth permanent travel surface for livestock or people. No surface materials are included with this scenario. Vegetation is not provided. Other associated practices include Fence (382), Critical Area Planting (342), Obstruction Removal (500), and Stream Crossing (578). Stream Crossing will be used when the trail or lane crosses streams or shallow water areas.

Feature Measure: Length of Trail or Walkway

Scenario Unit: Linear Feet

Scenario Typical Size: 500.00

Scenario Total Cost: $1,756.81

Scenario Cost/Unit: $3.51

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	133	$533.33
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.45	133	$458.85
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 575 - Trails and Walkways

Scenario: #2 - Gravel Walkway

Scenario Description:

Construct a trail or walkway with min 6 inch thick compacted a gravel surface treatment in moderately well drained areas. Trails and walkways range in width from 8ft to 12ft. Typical width of 12ft is used. Trails and Walkways may be applied as part of a resource management system to improve grazing efficiency and distribution, and/or protect ecologically sensitive, erosive and/or potentially erosive sites being used for a trail or walkway. The trail and walkway surface treatment will stabilize the pathway and address the resource concerns of soil erosion and water quality degradation. Costs include earthfill, shaping, grading, surface material, some seeding including the equipment, labor and materials necessary to install the practice.

Before Situation:

This practice applies on all lands where management of animal or human movement is needed to address soil erosion and water quality resource concerns. This practice applies to trails or walkways constructed for use by off-road vehicles, such as All-Terrain Vehicles or snowmobiles, which are not designed for use on public roads. It does not apply to roads constructed for movement of equipment or vehicles. Use NRCS Conservation Practice Standard Access Road (Code 560).

After Situation:

The typical trail or walkway is constructed 12 foot wide with 6 inch gravel surfacing and 5 ft of seeding along both sides of the trail or walkway. The trail or walkway averages a 0.5 ft crown height with 2:1 side slopes, 500 ft long with a crowned surface for drainage. All excavation, grading, aggregate surfacing treatment and seeding is constructed as necessary to provide a smooth permanent travel pathway for animal, pedestrian, or other off-road modes of recreation travel. Other associated practices include Fence (382), Mulch (484), Obstruction Removal (500), and Stream Crossing (578).

Feature Measure: Length of trail or walkway

Scenario Unit: Linear Feet

Scenario Typical Size: 500.00

Scenario Total Cost: $6,998.02

Scenario Cost/Unit: $14.00

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.45	151	$520.95
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	6	$469.80
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.61	0.11	$0.84
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	6	$172.26
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	6	$240.78
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	133	$4,037.88
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	6.9	$4.69
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.81	6.9	$5.59
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	6.9	$4.69
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$26.18	0.23	$6.02
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$47.76	0.11	$5.25
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 575 - Trails and Walkways

Scenario: #3 - Gravel over Geotextile

Scenario Description:

Construct a trail or walkway with a 9 inch thick compacted gravel surface treatment over geotextile. Trails and walkways widths range from 8ft to 12ft, and 6'-12' gravel thickness depending on the soil consistency and type of animal, an average aggregate thickness of 9 inches is used with a typical width of 12ft. Trails and Walkways may be applied as part of a resource management system to improve grazing efficiency and distribution, and/or protect ecologically sensitive, erosive and/or potentially erosive sites being used for a trail or walkway. The trail and walkway surface treatment will stabilize the pathway and address the resource concerns of soil erosion and water quality degradation. Costs include some earthfill, shaping, grading, surface material, some seeding including the equipment, labor and materials necessary to install the practices. The trail and walkway surface treatment will stabilize the pathway and address the resource concerns of soil erosion and water quality degradation.

Before Situation:

This practice applies on all lands where management of animal or human movement is needed to address soil erosion and water quality resource concerns. This practice applies to a trails or walkways constructed for use by off-road vehicles, such as All-Terrain Vehicles or snowmobiles, which are not designed for use on public roads. It does not apply to roads constructed for movement of equipment or vehicles. Use NRCS Conservation Practice Standard Access Road (Code 560). Soils are poorly drained to well drained.

After Situation:

A trail or walkway is constructed 12 foot wide 500 foot long with a crowned surface for drainage, with a compacted gravel surface over geotextile. All excavation, grading, aggregate surfacing treatment, geotextile and seeding is constructed as necessary to provide a smooth permanent travel pathway for animal, pedestrian, or other off-road modes of recreation travel. The pathway consist of 12 ft wide, 500 ft long with 9 inches of fine aggregate or gravel surface over geotextile fabric, crown height of trail is average of 9 inches height with typical side slopes of 2:1. Includes 5 feet of seeding along both sides of the trail and walkway. Other associated practices include Fence (382), Mulch (484), Obstruction Removal (500), and Stream Crossing (578), , or Critical Area Planting (342) were a larger area of seeding is needed.

Feature Measure: Length of trail or walkway

Scenario Unit: Linear Feet

Scenario Typical Size: 500.00

Scenario Total Cost: $12,700.32

Scenario Cost/Unit: $25.40

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.45	207	$714.15
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	12	$939.60
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.61	0.11	$0.84
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	22	$631.62
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	12	$481.56
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	207	$6,284.52
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	6.9	$4.69
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.81	6.9	$5.59
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	6.9	$4.69
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$26.18	0.23	$6.02
Geotextile, non-woven, heavy weight	1210	Non-woven greater than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	$1.89	850	$1,606.50
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$47.76	0.11	$5.25
Mobilization						

Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 575 - Trails and Walkways

Scenario: #4 - Gravel Over Graded Rock

Scenario Description:

Construct a trail or walkway with a 4 inch thick gravel surface treatment over 6 inch base course graded rock. Trails and walkways widths range from 8ft to 12ft. Typical width of 12ft is used. Trails and Walkways may be applied as part of a resource management system to improve grazing efficiency and distribution, and/or protect ecologically sensitive, erosive and/or potentially erosive sites being used for a trail or walkway. The trail and walkway surface treatment will stabilize the pathway and address the resource concerns of soil erosion and water quality degradation. Costs include some earthfill, shaping, grading, surface material, some seeding including the equipment, labor and materials necessary to install the practice.

Before Situation:

This practice applies on all lands where management of animal or human movement is needed to address soil erosion and water quality resource concerns. This practice applies to a trails or walkways constructed for use by off-road vehicles, such as All-Terrain Vehicles or snowmobiles, which are not designed for use on public roads. It does not apply to roads constructed for movement of equipment or vehicles. Use NRCS Conservation Practice Standard Access Road (Code 560). Soils are poorly drained to well drained.

After Situation:

A trail or walkway is constructed 12 foot wide 500 foot long with a crowned surface for drainage. All grading, aggregate surfacing treatment, rock subgrade with some seeding is constructed as necessary to provide a smooth permanent travel pathway for animal, pedestrian, or other off-road modes of recreation travel. The pathway consists of 4 inches of fine aggregate or gravel surface over 6 inches of graded base course rock, with an embankment average height of 6 inches and sides slopes of 2:1. Includes 5 feet of seeding along both sides of the trail and walkway. Other associated practices include Fence (382), Mulch (484), Obstruction Removal (500), and Stream Crossing (578), or Critical Area Planting (342) where a larger area of seeding is needed.

Feature Measure: Length of trail or walkway

Scenario Unit: Linear Feet

Scenario Typical Size: 500.00

Scenario Total Cost: $10,250.52

Scenario Cost/Unit: $20.50

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.45	151	$520.95
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	14	$1,096.20
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.61	0.11	$0.84
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	6	$172.26
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	14	$561.82
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	86	$2,610.96
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	6.9	$4.69
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.81	6.9	$5.59
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	6.9	$4.69
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$26.18	0.23	$6.02
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$23.32	147	$3,428.04
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$47.76	0.11	$5.25
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 575 - Trails and Walkways

Scenario: #5 - Gravel Over Graded Rock and Geotextile

Scenario Description:

Construct a trail or walkway with a 4-inch gravel surface treatment over 6-inch graded rock (base course) and geotextile. Trails and walkways widths range from 8ft to 12ft. Typical width of 12ft is used. Trails and Walkways may be applied as part of a resource management system to improve grazing efficiency and distribution, and/or protect ecologically sensitive, erosive and/or potentially erosive sites being used for a trail or walkway. The trail and walkway surface treatment will stabilize the pathway and address the resource concerns of soil erosion and water quality degradation. Costs include some earthfill, shaping, grading, rock, gravel, geotextile, some seeding, including the equipment, labor and materials necessary to install the practice.

Before Situation:

This practice applies on all lands where management of animal or human movement is needed to address soil erosion and water quality resource concerns. This practice applies to a trails or walkways constructed for use by off-road vehicles, such as All-Terrain Vehicles or snowmobiles, which are not designed for use on public roads. It does not apply to roads constructed for movement of equipment or vehicles. Use NRCS Conservation Practice Standard Access Road (Code 560). Soils are poorly drained to well drained.

After Situation:

A trail or walkway is constructed 12 foot wide 500 foot long with a crowned surface for drainage, 4-inch gravel surfacing over 6-inch graded rock (base course) over geotextile. Constructed as an embankment average 12 inches with side slopes of 2:1 and seeded 5ft along both sides of the trail/walkway. All grading, aggregate surfacing treatment, rock subgrade, geotextile and some seeding is constructed as necessary to provide a smooth permanent travel pathway for animal, pedestrian, or other off-road modes of recreation travel. Soil erosion and degradation of water quality is addressed. Other associated practices include Fence (382), Mulch (484), Obstruction Removal (500), and Stream Crossing (578), or Critical Area Planting (342) where a larger area of seeding is needed.

Feature Measure: Length of Trail or Walkway

Scenario Unit: Linear Feet

Scenario Typical Size: 500.00

Scenario Total Cost: $13,075.44

Scenario Cost/Unit: $26.15

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.45	325	$1,121.25
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	14	$1,096.20
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.61	0.11	$0.84
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	22	$631.62
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	14	$561.82
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	86	$2,610.96
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	6.9	$4.69
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.81	6.9	$5.59
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	6.9	$4.69
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$26.18	0.23	$6.02
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$23.32	146	$3,404.72
Geotextile, non-woven, heavy weight	1210	Non-woven greater than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	$1.89	850	$1,606.50
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$47.76	0.11	$5.25
Mobilization						

Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 575 - Trails and Walkways

Scenario: #6 - Gravel Over Graded Rock and Sand Bedding

Scenario Description:

Construct a trail or walkway with 4-inch-thick compacted gravel surface treatment over 8-inch graded rock (base course) over 6-inch sand filter. Trails and walkways widths range from 8ft to 12ft. Typical width of 12ft is used. Trails and Walkways may be applied as part of a resource management system to improve grazing efficiency and distribution, and/or protect ecologically sensitive, erosive and/or potentially erosive sites being used for a trail or walkway. The trail and walkway surface treatment will stabilize the pathway and address the resource concerns of soil erosion and water quality degradation. Costs include some earthfill, shaping, grading, sand bedding base, graded rock foundation with gravel surface treatment, seeding 5ft along both sides, including the equipment, labor and materials necessary to install the practice.

Before Situation:

This practice applies on all lands where management of animal or human movement is needed to address soil erosion and water quality resource concerns. This practice applies to a trails or walkways constructed for use by off-road vehicles, such as All-Terrain Vehicles or snowmobiles, which are not designed for use on public roads. It does not apply to roads constructed for movement of equipment or vehicles. Use NRCS Conservation Practice Standard Access Road (Code 560). Soils are poorly drained.

After Situation:

A trail or walkway is constructed 12 foot wide 500 foot long with a crowned surface for drainage, with 4-inch compacted fine gravel surface over 8-inch graded rock (base course) over 6-inch sand bedding. The trail/walkway is constructed as an embankment with an average height of 18 inches and 2:1 side slopes. All grading, aggregate surfacing treatment, rock subgrade, sand filter and some seeding is constructed as necessary to provide a smooth permanent travel pathway for animal, pedestrian, or other off-road modes of recreation travel. Erosion and water quality concerns have been addressed. Includes 5 feet of seeding along both sides of the trail and walkway. Other associated practices include Fence (382), Mulch (484), Obstruction Removal (500), and Stream Crossing (578), or Critical Area Planting (342) where a larger area of seeding is needed.

Feature Measure: Length of Trail or Walkway

Scenario Unit: Linear Feet

Scenario Typical Size: 500.00

Scenario Total Cost: $16,181.09

Scenario Cost/Unit: $32.36

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	16	$1,252.80
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.61	0.11	$0.84
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	6	$172.26
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	16	$642.08
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	260	$7,893.60
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	6.9	$4.69
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.81	6.9	$5.59
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	6.9	$4.69
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$26.18	0.23	$6.02
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$23.32	200	$4,664.00
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$47.76	0.11	$5.25
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 575 - Trails and Walkways

Scenario: #7 - Concrete, Walkway

Scenario Description:

Layout and construct a trail or walkway with reinforced concrete walkway on a sand foundation surface treatment for all uses included under the CPS 575 Purpose section. Trails and Walkways may be applied as part of a resource management system to improve grazing efficiency and distribution, and/or protect ecologically sensitive, erosive and/or potentially erosive sites being used for a trail or walkway. The trail and walkway surface treatment will stabilize the pathway and address the resource concerns of soil erosion and water quality degradation. Costs include earthfill, excavation, shaping, grading, surface material, seeding and all equipment, labor and incidental materials necessary to install the practices.

Before Situation:

This practice applies on all lands where management of animal or human movement is needed to address soil erosion and water quality resource concerns. This practice applies to a trails or walkways constructed for use by off-road vehicles, such as All-Terrain Vehicles or snowmobiles, which are not designed for use on public roads. It does not apply to roads constructed for movement of equipment or vehicles. Use NRCS Conservation Practice Standard Access Road (Code 560).

After Situation:

A trail or walkway is constructed 12 foot wide 300 foot long, All excavation, grading, with a concrete surfacing treatment is constructed as necessary to provide a smooth permanent travel pathway for livestock or people is included. The pathway consist of approximately 9 inches of excavation, 5 inches of concrete with a 6 inch sand foundation. and 5 feet of seeding along both sides of the trail and walkway. Other associated practices include Fence (382), Mulch (484), Obstruction Removal (500), and Stream Crossing (578).

Feature Measure: Length of Trail or Walkway

Scenario Unit: Linear Feet

Scenario Typical Size: 300.00

Scenario Total Cost: $32,983.02

Scenario Cost/Unit: $109.94

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	56	$28,070.00
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	100	$252.00
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	67	$418.75
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	3	$234.90
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	3	$76.08
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	0.16	$2.38
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.61	0.16	$1.22
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	0.16	$3.56
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$10.18	0.16	$1.63
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	4	$175.48
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	5	$143.55
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	3	$120.39
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	67	$1,933.62
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	4.1	$2.79

Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.81	4.1	$3.32
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	4.1	$2.79
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$26.18	0.14	$3.67
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$47.76	0.16	$7.64
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 575 - Trails and Walkways

Scenario: #9 - Gravel over Geogrid over Geotextile

Scenario Description:

Construct a trail or walkway with gravel surface treatment over geogrid and non-woven geotextile for all uses included under the CPS 575 Purpose section. Trails and Walkways may be applied as part of a resource management system to improve grazing efficiency and distribution, and/or protect ecologically sensitive, erosive and/or potentially erosive sites being used for a trail or walkway. The trail and walkway surface treatment will stabilize the pathway and address the resource concerns of soil erosion and water quality degradation. Costs include some earthfill, shaping, grading, gravel surface material, geogrid, geotextile, some seeding including the equipment, labor and materials necessary to install the practice.

Before Situation:

This practice applies on all lands where management of animal or human movement is needed to address soil erosion and water quality resource concerns. This practice applies to a trails or walkways constructed for use by livestock, people, and off-road vehicles, such as All-Terrain Vehicles or snowmobiles, which are not designed for use on public roads. It does not apply to roads constructed for movement of equipment or vehicles. Use NRCS Conservation Practice Standard Access Road (Code 560).

After Situation:

A trail or walkway is constructed 12 foot wide 300 foot long with a crowned surface for drainage, 3600 square foot trail of Gravel over Geogrid on a geotextile fabric foundation surface treatment. All grading and shaping necessary to provide a smooth permanent travel pathway for livestock or people is included. The pathway consists of approximately 9 inches of Gravel over geogrid over a geotextile fabric. Constructed with an embankment 6-inch avg height and 2:1 side slopes. Includes 5 feet of seeding along both sides of the trail and walkway. Other associated practices include Fence (382), Mulch (484), Obstruction Removal (500), and Stream Crossing (578), or Critical Area Planting (342) where a larger area of seeding is needed.

Feature Measure: Length of Trail or Walkway

Scenario Unit: Linear Feet

Scenario Typical Size: 300.00

Scenario Total Cost: $12,492.07

Scenario Cost/Unit: $41.64

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.45	91	$313.95
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	10	$783.00
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.61	0.07	$0.53
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	10	$287.10
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	10	$401.30
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	124	$3,764.64
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	4.1	$2.79
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.81	4.1	$3.32
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	4.1	$2.79
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$26.18	0.14	$3.67
Geotextile, non-woven, heavy weight	1210	Non-woven greater than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	$1.89	480	$907.20
Geonet	1778	Geosynthetic drainage liner, typically HDPE of 300 mil thickness. Includes materials and shipping only.	Square Yard	$9.86	406	$4,003.16
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$47.76	0.07	$3.34
Mobilization						

Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 575 - Trails and Walkways

Scenario: #16 - Boardwalk, wood post foundation

Scenario Description:
A 4 foot wide, 100 foot long, timber boardwalk trail installed on level or rolling topography, over wet terrain. This trail is constructed from treated, dimensional lumber, and is supported by helical screwpiles or other micropiles. The trail type is generally constructed on seasonally or continuously wet or saturated ground. This scenario typically addresses the following resource concern: 'Inadequate habitat for fish and wildlife-habitat degradation'. Practice is located at an off-road usually in a remote location.

Before Situation:
Habitat is impacted, generally in the form of erosion and impacts to critical nesting habitat, due to ATV and other traffic.

After Situation:
Hardened trail surface provides a stable, and favorable traffic corridor, which prevents erosion and reduces impacts to critical habitat. If clearing and grubbing of land in the alignment area is required, use Land Clearing (460). When seeding or revegetation is required, use Critical Area Planting (342).

Feature Measure: Area of trail surface installed

Scenario Unit: Square Feet

Scenario Typical Size: 400.00

Scenario Total Cost: $48,440.14

Scenario Cost/Unit: $121.10

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$56.88	33.5	$1,905.48
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	80	$2,296.80
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	33.5	$1,017.06
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	24	$1,166.40
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	16	$1,783.20
Materials						
Lumber, planks, posts and timbers, treated	1609	Treated dimension lumber with nominal thickness greater than 2 inches. Includes lumber and fasteners. Does not include labor.	Board Feet	$3.53	2477	$8,743.81
Steel, Structural Braces and Supports	2497	Structural steel in various sizes and shapes. Includes materials and shipping only.	Pound	$1.54	280	$431.20
Helical Pier System, Low Load Bearing	2498	Steel helical pier system up to a 15 ft. solid steel square, tubular, or pipe style shaft with an 8 - 12 inch diameter multiple helix, and a U-shaped timber saddle top. Includes materials and shipping only.	Each	$880.16	28	$24,644.48
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	5505	$5,505.00
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 575 - Trails and Walkways

Scenario: #55 - Wood Chips, Walkway, 1000 sqft or less

Scenario Description:

Layout and construct a wood chip surface treatment on a earthen foundation walkway to facilitate the movement of animals, people, or small off-road vehicles to provide or improve access to forage, water, working/handling facilities, and/or shelter, Improve grazing efficiency and distribution, and/or protect ecologically sensitive, erosive and/or potentially erosive sites, pedestrian or off-road vehicle access to agricultural, construction, or maintenance operations, provide walkways for recreational activities or access to recreation sites and address the resource concerns of soil erosion and water quality degradation. Costs include excavation, shaping, grading, wood chip surfacing, vegetation of disturbed areas, all equipment, labor and incidental materials necessary to install the practice.

Before Situation:

This practice applies on all lands where management of animal or human movement is needed to address soil erosion and water quality resource concerns. This practice applies to a trails or walkways constructed for use by small off-road vehicles, such as All-Terrain Vehicles or snowmobiles, which are not designed for use on public roads. It does not apply to roads constructed for movement of equipment or vehicles. Use NRCS Conservation Practice Standard Access Road (Code 560).

After Situation:

The typical walkway will be a 6 foot widex100 foot longx4' thick , 600 square foot of wood chip surface treatment on earthen foundation. All excavation, grading and shaping necessary to provide a smooth permanent travel surface for livestock or people is included. Included is wood chips of 600 square foot for surfacing.

Feature Measure: sqft of walkway

Scenario Unit: Square Feet

Scenario Typical Size: 600.00

Scenario Total Cost: $1,203.49

Scenario Cost/Unit: $2.01

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	7	$177.52
Aggregate, Wood Chips	1098	Includes materials, equipment and labor to transport and place.	Cubic Yards	$50.92	8	$407.36
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	15	$430.65
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	1	$48.60
Materials						
Geotextile, non-woven, light weight	1209	Non-woven less than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	$2.08	67	$139.36

Practice: 576 - Livestock Shelter Structure

Scenario: #1 - Portable Shade Structure

Scenario Description:
A flexible membrane or fabric-like roof placed on a steel or wood portable frame used to promote animal health where prescribed grazing practices have limited livestock access to shade. Cost estimate is based upon a 25 ft x 40 ft portable structure.Associated practices include Fence (382), Prescribed Grazing (528), Livestock Pipeline (516) and Watering Facility (614).

Before Situation:
Livestock are being managed using a prescribed grazing plan resulting in a lack of shade during the summer months. The livestock are stressed and eat less frequently.

After Situation:
Livestock shade structures are rotated and sized according to NRCS plans and specifications. Livestock access to water, shade, and forage are dispersed to decrease animal stress and promote a better grazing and nutrient spreading.

Feature Measure: Area of Roof Frame

Scenario Unit: Square Feet

Scenario Typical Size: 1,000.00

Scenario Total Cost: $6,856.44

Scenario Cost/Unit: $6.86

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	8	$202.88
Portable Welder	1407	Portable field welder. Equipment only. Labor not included.	Hours	$19.45	16	$311.20
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	16	$701.92
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Materials						
Steel, Plate, 3/16 in.	1048	Flat Steel Plate, 3/16 inch thick, materials only.	Square Feet	$11.25	2	$22.50
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.29	17.3	$39.62
Pipe, smooth steel, weight priced	1325	Smooth Steel pipe priced by the weight of the pipe materials. Materials only.	Pound	$3.47	889.5	$3,086.57
Synthetic Liner, 60 mil	2109	Synthetic 60 mil HDPE, LLDPE, EPDM, etc. membrane liner material. Includes materials and shipping only.	Square Feet	$2.08	1000	$2,080.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08

Practice: 576 - Livestock Shelter Structure

Scenario: #2 - Fabricated Wind Shelter

Scenario Description:
Fabricated Livestock Wind Shelter is installed to provide protection for livestock.

Before Situation:
Herds are held and fed in fragile riparian areas in order to reduce stress on domestic animals from harsh winter conditions and provide protection from wind. The concentration of animals in these areas degrade streambanks, cause excessive sedimentation, damage woody vegetation, overgraze herbacious vegetation, in addition to degrading water quality through manure deposition and erosion. Resource concerns are water quality, animal health, plant productivity, health, and vigor, and inadequate shelter.

After Situation:
Fabricated wind shelters are installed in order to provide shelter for livestock in upland grazing areas away from the riparian zones. As a result, animals can be held in an area away from the riparian zone thereby eliminating the impacts to water quality and riparian health. A typical scenario is a Fabricated Wind Shelter installed in association with an animal feeding operation (AFO). The AFO has been moved out of the riparian zone where shelter was previously provided by the surrounding riparian woody vegetation. The AFO has been moved to a location where shelter is not naturally provided and needs to be fabricated. The typical fabrication involves a wood framed, metal or wood faced, 8.5 - foot high, 200 - foot long, fabricated wind shelter, 80% solid face, secured to the ground with wood posts.

Feature Measure: Length of Wind Shelter

Scenario Unit: Feet

Scenario Typical Size: 200.00

Scenario Total Cost: $7,687.63

Scenario Cost/Unit: $38.44

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	8	$529.44
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	8	$202.88
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	16	$459.36
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	8	$321.04
Materials						
Post, Wood, CCA treated, 6 in. x 12-14 ft.	13	Wood Post, Line/End 6 inch dia. X 12-14 ft., CCA Treated. Includes materials and shipping only.	Each	$38.98	26	$1,013.48
Corrugated Steel, 22 gauge	224	Corrugated or ribbed, galvanized, 22 gauge, includes fasteners, materials only.	Square Feet	$2.18	1360	$2,964.80
Dimension Lumber, Treated	1044	Treated dimension lumber with nominal thickness equal or less than 2 inches. Includes lumber and fasteners	Board Feet	$1.79	800	$1,432.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 578 - Stream Crossing

Scenario: #1 - Rock Surfaced Stream Crossing

Scenario Description:
Stabilize the bottom and slope of a stream channel using rock. This scenario includes site preparation, dewatering, acquiring and installing gravel or geotextile with rock riprap on channel bottom and approaches. Final travel surface shall be the rock. If a different travel surface is needed, refer to another appropriate standard for the surfacing. Use (396) Aquatic Organism Passage instead, when the primary intent is biological concerns, not hydrologic.

Before Situation:
Water flow could not cross access road or trail without erosion; or access road or trail could not cross channel.

After Situation:
Stream flow is not impeded and a stable base exists for equipment, people and/or animals to cross. Typical stream crossing has 20 foot bottom width and approaches. Length is 100 feet for a total area of 2,000 SqFt. Associated practices could be (342) Critical Area Planting, (560) Access Road, (575) Animal Trails and Walkways, (566) Recreational Trails and Walkways, (500) Obstruction Removal, or (584) Channel Stabilization.

Feature Measure: square footage of rock surfacing

Scenario Unit: Square Feet

Scenario Typical Size: 2,000.00

Scenario Total Cost: $4,911.72

Scenario Cost/Unit: $2.46

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, common earth, side cast, large equipment	1227	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$1.61	74	$119.14
Truck, dump, 8 CY	1401	Dump truck for moving bulk material. Typically capacity is 12 ton or 8 cubic yards. Includes equipment only.	Hours	$55.22	2	$110.44
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	2	$80.26
Materials						
Geotextile, non-woven, heavy weight	1210	Non-woven greater than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	$1.89	222	$419.58
Aggregate, river rock	1834	Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Ton	$25.51	104	$2,653.04
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 578 - Stream Crossing

Scenario: #2 - Paved Stream Crossing

Scenario Description:
Stabilize the bottom and slope of a stream channel using concrete surfacing. This scenario includes site preparation, dewatering, placing concrete surfacing and gravel base on channel bottom and approaches. Final travel surface shall be concrete. If a different travel surface is needed, refer to another appropriate standard for the surfacing. Use (396) Aquatic Organism Passage instead, when the primary intent is biological concerns, not hydrologic.

Before Situation:
Water flow could not cross access road or trail without erosion; or access road or trail could not cross channel.

After Situation:
Stream flow is not impeded and a stable base exists for equipment, people and/or animals to cross. Typical stream crossing has 20 foot bottom width and approaches. Length is 100 feet for a total area of 2,000 SqFt. Associated practices could be (342) Critical Area Planting, (560) Access Road, (575) Animal Trails and Walkways, (566) Recreational Trails and Walkways, (500) Obstruction Removal, or (584) Channel Stabilization.

Feature Measure: Square footage of concrete surfacin

Scenario Unit: Square Feet

Scenario Typical Size: 2,000.00

Scenario Total Cost: $12,851.71

Scenario Cost/Unit: $6.43

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, Slab on Grade, non reinforced	1225	Non reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$309.79	31	$9,603.49
Excavation, common earth, side cast, large equipment	1227	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$1.61	68	$109.48
Truck, dump, 8 CY	1401	Dump truck for moving bulk material. Typically capacity is 12 ton or 8 cubic yards. Includes equipment only.	Hours	$55.22	2	$110.44
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	8	$350.96
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	2	$80.26
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	37	$1,067.82
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 578 - Stream Crossing

Scenario: #3 - Culvert installation, < 25 inch Diameter, Single culvert

Scenario Description:
Install a new culvert. Work includes; site preparation, installation of culvert pipe with gravel bedding and fill (compacted), and building headwalls. If a different travel surface is needed, refer to another appropriate standard for the surfacing. 12 inch Culvert installation with 40 cy of fill needed and 2 yds. rock riprap for headwalls. Pipe is 36 feet long. Use (396) Aquatic Organism Passage instead, when the primary intent is biological concerns, not hydrologic. Use (587) Structure for Water Control instead, for ditch cross culverts and other intermittent flows.

Before Situation:
Water flow could not cross access road or trail without erosion; or access road or trail could not cross channel.

After Situation:
Access road and waterflow are able to cross each other in a stable manner. Stream flow is not impeded and a stable base exists for equipment, people and/or animals to cross. Associated practices could be (342) Critical Area Planting, (560) Access Road, (575) Animal Trails and Walkways, (566) Recreational Trails and Walkways, (500) Obstruction Removal, (570) Stormwater Runoff Control, or (584) Channel Stabilization.

Feature Measure: Length of Culvert

Scenario Unit: Feet

Scenario Typical Size: 36.00

Scenario Total Cost: $3,294.25

Scenario Cost/Unit: $91.51

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	40	$100.80
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	40	$250.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	10	$287.10
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement.	Cubic Yards	$136.88	2	$273.76
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	31	$941.16
Pipe, CMP, 18-16 gauge, weight priced	1322	18 and 16 gauge galvanized helical corrugated metal pipe priced by the weight of the pipe materials. Materials only.	Pound	$2.00	338.4	$676.80
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 578 - Stream Crossing

Scenario: #4 - Culvert installation, < 25 inch Diameter, Double culverts

Scenario Description:

Install a new double barrel culvert. Work includes; site preparation, installation of culvert pipe with gravel bedding and fill (compacted), and building headwalls. If a different travel surface is needed, refer to another appropriate standard for the surfacing. Two 12 inch culverts with 60 cy of fill needed and 2 yds rock riprap for headwalls. Each pipe is 36 feet long.Use (396) Aquatic Organism Passage instead, when the primary intent is biological concerns, not hydrologic. Use (587) Structure for Water Control instead, for ditch cross culverts and other intermittent flows.

Before Situation:

Water flow could not cross access road or trail without erosion; or access road or trail could not cross channel.

After Situation:

Access road and waterflow are able to cross each other in a stable manner.Stream flow is not impeded and a stable base exists for equipment, people and/or animals to cross. Associated practices could be (342) Critical Area Planting, (560) Access Road, (575) Animal Trails and Walkways, (566) Recreational Trails and Walkways, (500) Obstruction Removal, (570) Stormwater Runoff Control, or (584) Channel Stabilization.

Feature Measure: Length of Culvert

Scenario Unit: Feet

Scenario Typical Size: 36.00

Scenario Total Cost: $4,146.45

Scenario Cost/Unit: $115.18

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	60	$151.20
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	60	$375.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	10	$287.10
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement.	Cubic Yards	$136.88	2	$273.76
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	31	$941.16
Pipe, CMP, 18-16 gauge, weight priced	1322	18 and 16 gauge galvanized helical corrugated metal pipe priced by the weight of the pipe materials. Materials only.	Pound	$2.00	676.8	$1,353.60
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 578 - Stream Crossing

Scenario: #5 - Culvert, > 25 inch Diameter to <= 48 inch Diameter, Single Culvert

Scenario Description:
Install a new culvert. Work includes; site preparation, installation of culvert pipe with gravel bedding and fill (compacted), and building headwalls. If a different travel surface is needed, refer to another appropriate standard for the surfacing. 36 inch culvert installation with 40 cy of fill needed and 2 yds rock riprap for headwalls. Pipe is 36 feet long. Use (396) Aquatic Organism Passage instead, when the primary intent is biological concerns, not hydrologic. Use (587) Structure for Water Control instead, for ditch cross culverts and other intermittent flows.

Before Situation:
Water flow could not cross access road or trail without erosion; or access road or trail could not cross channel.

After Situation:
Access road and waterflow are able to cross each other in a stable manner. Stream flow is not impeded and a stable base exists for equipment, people and/or animals to cross. Associated practices could be (342) Critical Area Planting, (560) Access Road, (575) Animal Trails and Walkways, (566) Recreational Trails and Walkways, (500) Obstruction Removal, (570) Stormwater Runoff Control, or (584) Channel Stabilization.

Feature Measure: Length of Culvert

Scenario Unit: Feet

Scenario Typical Size: 36.00

Scenario Total Cost: $3,709.85

Scenario Cost/Unit: $103.05

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	40	$250.00
Excavation, common earth, wet, side cast, large equipment	1228	Bulk excavation and side casting of wet common earth with hydraulic excavator or dragline with greater than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$4.72	40	$188.80
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	10	$287.10
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement.	Cubic Yards	$136.88	2	$273.76
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	31	$941.16
Pipe, CMP, 14-12 gauge, weight priced	1589	14 and 12 gauge galvanized helical corrugated metal pipe priced by the weight of the pipe materials. Materials only.	Pound	$0.93	1080	$1,004.40
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 578 - Stream Crossing

Scenario: #6 - Culvert installation, > 25 inch Diameter, to <= 48 inch Diameter Double culverts

Scenario Description:
Install a new double barrel culvert. Work includes; site preparation, installation of culvert pipe with gravel bedding and fill (compacted), and building headwalls. If a different travel surface is needed, refer to another appropriate standard for the surfacing. Two 30 inch culverts with 60 cy of fill needed and 2 yds. rock riprap for headwalls. Each pipe is 36 feet long. Use (396) Aquatic Organism Passage instead, when the primary intent is biological concerns, not hydrologic. Use (587) Structure for Water Control instead, for ditch cross culverts and other intermittent flows.

Before Situation:
Water flow could not cross access road or trail without erosion; or access road or trail could not cross channel.

After Situation:
Access road and waterflow are able to cross each other in a stable manner. Stream flow is not impeded and a stable base exists for equipment, people and/or animals to cross. Associated practices could be (342) Critical Area Planting, (560) Access Road, (575) Animal Trails and Walkways, (566) Recreational Trails and Walkways, (500) Obstruction Removal, (570) Stormwater Runoff Control, or (584) Channel Stabilization.

Feature Measure: Length of Culvert

Scenario Unit: Feet

Scenario Typical Size: 36.00

Scenario Total Cost: $4,933.65

Scenario Cost/Unit: $137.05

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	60	$375.00
Excavation, common earth, wet, side cast, large equipment	1228	Bulk excavation and side casting of wet common earth with hydraulic excavator or dragline with greater than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$4.72	60	$283.20
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	10	$287.10
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement.	Cubic Yards	$136.88	2	$273.76
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	31	$941.16
Pipe, CMP, 14-12 gauge, weight priced	1589	14 and 12 gauge galvanized helical corrugated metal pipe priced by the weight of the pipe materials. Materials only.	Pound	$0.93	2160	$2,008.80
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 578 - Stream Crossing

Scenario: #8 - Bottomless Culvert

Scenario Description:

A multi-plate galvanized steel or aluminum culvert (arch or box) used at a road-stream crossing and promote stream ecological and geomorphic function. They commonly attach to preformed reinforced or poured-in-place concrete footings. Due to state regulations bottomless culverts are typically filled with a mixture of rock and gravel sized to emulate site stream conditions. The simulated streambed material is continuous throughout the culvert, and blended with the intact streambed at the culvert inlet and outlet. Culvert span is selected according to channel bed composition and texture, bank characteristics, channel alignment at the crossing section, and other parameters that may affect channel dynamics and stability. Culvert length is determined by roadway geometry, loading requirements, and site stream conditions. Concrete headwalls and wingwalls are typical for this scenario to facilitate a shorter installation which is preferable to limit the structure footprint in the watercourse. Bottomless arch or box culverts are commonly delivered in sections and bolted together in the field. Smaller arches can be delivered in one piece. They are installed with an assortment of equipment used for excavation, placing material, and delivering and removing material. Stream dewatering and diversion around the work site is included. Footings are placed or poured, and the new streambed culvert is set at a slope that matches the design longitudinal profile, and backfilled with a bed mixture that mimics adjacent stream characteristics. Larger rock may be placed along the footing/culvert stemwall to protect the connection from damage by transported bedload movement and as bank material. The roadway is replaced and any necessary armoring material is placed at the culvert inlet and outlet where it intersects the road fill prism. This scenario does not include additional measures needed to address channel incision, bank stability, and other factors associated with the presence of the stream crossing. RESOURCE CONCERNS: INADEQUATE HABITAT FOR FISH AND WILDLIFE ???Habitat degradation; EXCESS WATER ??? Ponding, flooding, seasonal high water table, seeps, and drifted snow; WATER QUALITY DEGRADATION ??? Elevated water temperature; SOIL EROSION??? Excessive bank erosion from streams shorelines or water conveyance channels. Contract associated practices separately to address site preparation and reclamation associated with project footprint: (570) Stormwater Runoff Control, (500) Obstruction Removal, (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment; ---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management, ---Structural Measures outside of project footprint may include: (410) Grade Stabilization Structure, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection

Before Situation:

An existing undersized culvert has contributed to general bed and bank scour downstream of a road crossing. The road may be overtopped by high flows, resulting in outright failure, excessive channel erosion, landowner accessibility problems, access by and to emergency services, and hamper post-flood recovery efforts. An upstream impoundment created by the undersized culvert has contributed to water quality problems including high water temperatures and the deposition and later mobilization of polluted fine sediment.

After Situation:

The undersized culvert is replaced with a bottomless arch or box culvert that is sized, placed, and backfilled with material determined by geomorphic analyses performed. Geomorphic and ecological functions are preserved through the crossing site, enhancing water quality, and culvert longevity. In addition, because the culvert is sized to promote the transport of streamflow and the materials it carries, it requires decreased maintenance activities over time. Landowners are able to access their holdings across a range of flows, and are able to seek and receive emergency and post-flood recovery services. Resource Concerns are addressed within the context of the site. Typical scenario is the installation of a bottomless galvanized multi-plate arch structure (7ga.) set on precast concrete footings with headwalls and wingwalls. The typical size is 10' span x 5'-2' rise x 34' long, under a two-lane road 24ft wide with two - 5ft shoulders (Total length of culvert needed is 34 ft). Scenario unit is cubic feet using the culvert published cross-sectional area; square feet x (Length of culvert under the road + total shoulder width). Footings are protected from scour by rock riprap and natural channel bed under the culvert. Published cross-sectional area of bottomless culvert with 10ft span and 5ft-2inches rise = 41.2sq.ft. Typical scenario = 41.2sf x (24ft +10ft) = 1,400.8 cu.ft.

Feature Measure: Published cross-sect area x Length

Scenario Unit: Cubic Feet

Scenario Typical Size: 1,400.80

Scenario Total Cost: $125,104.66

Scenario Cost/Unit: $89.31

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	40	$22,683.20
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.11	72	$79.92
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	300	$1,875.00
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hours	$145.01	32	$4,640.32
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$56.88	5	$284.40
Water management, Flooding & dewatering	969	Includes equipment and power unit. Labor not included.	Acre Feet	$295.73	118	$34,896.14
Auger, Truck Mounted	2049	Truck mounted auger for large diameter excavation. Includes equipment and labor.	Hours	$113.27	2	$226.54
Crane, truck mounted, hydraulic, 80 ton	2569	80 ton capacity truck mounted hydraulic crane. Equipment cost only.	Hours	$349.47	3	$1,048.41
Labor						

Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	20	$877.40
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	64	$1,837.44
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	5	$151.80
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	35	$1,404.55
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	16	$777.60
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	115	$12,816.75
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement.	Cubic Yards	$136.88	31	$4,243.28
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	300	$8,658.00
Aggregate, river rock	1834	Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Ton	$25.51	18	$459.18
Footing, concrete, precast	1836	Precast spread footing with stemwall, T-shaped, with channel built to accept arched culvert leg. Includes materials only.	Feet	$85.47	68	$5,811.96
Geocell, 6 inch	1842	6-inch thick cellular confinement system, three-dimensional, expandable panels made from high-density polyethylene (HDPE), polyester or another polymer material. Includes materials, labor and equipment for the geocell only, does not include backfill.	Square Yard	$27.61	72	$1,987.92
Culvert, Multi-Plate arch	1979	Multi-plate arch culvert, typically 7 Gauge corrugated plate. Includes metal arch materials only, does not include footings.	Pound	$1.48	6052	$8,956.96
Sign, 3' x 2'	2259	.125 aluminum, single-sided, with nonreflective, EG reflective or HIP reflective face copy. Galvanized perforated square steel tube sign post with 2.5 x 30 inch non-perforated galvanized steel anchor, and Windbeam Bolt Assembly. Includes materials and shipping only.	Each	$223.56	2	$447.12
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	750	$750.00
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	2	$364.16
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	2	$1,846.38
Aggregate, Shipping, Cubic Yard-mile	2360	Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul).	Cubic Yard Mile	$0.42	17180	$7,215.60

Practice: 578 - Stream Crossing

Scenario: #9 - Concrete Box Culvert

Scenario Description:

A four-sided precast concrete box (square or rectangular) culvert used at a road-stream crossing and promote stream ecological and geomorphic function. Concrete box culverts are generally available in sections of 1-foot increments. Concrete box culverts are sized according to geomorphic analyses, not just an estimate of runoff and streamflow at the site from the contributing watershed. Due to state regulations box culverts are typically filled with a mixture of rock and gravel sized to emulate site stream conditions. The simulated streambed material is continuous throughout the culvert and blended with the intact streambed at the culvert inlet and outlet. The culvert width is determined by analyzing bankfull channel width on a reach of stream not affected by an existing road crossing or other conditions that alter self-formed conditions. When replacing a culvert, bankfull investigations are typically conducted with 10-20 estimated bankfull channel widths above the existing stream crossing or downstream if no suitable location can be found upstream. Culvert width is selected according to channel bed composition and texture, bank characteristics, channel alignment at the crossing section, and other parameters that may affect channel dynamics and stability. Culvert length is determined by roadway geometry, loading requirements, and site stream conditions. Concrete headwalls and wingwalls are typical for this scenario to facilitate a shorter installation which is preferable to limit the structure footprint in the watercourse. Concrete box culverts are delivered in sections and assembled onsite, and require adequate bed compaction throughout the crossing section. They are installed with an assortment of equipment used for excavation, placing material, and delivering and removing material. Stream dewatering and diversion around the work site is included. Channel bed material within the culvert varies according to prevailing stream characteristics at the crossing site and design velocities if they vary from upstream and downstream natural velocities. The culvert is placed within the roadway on a sub-excavated compacted bed, set at a slope that matches the design longitudinal profile, and backfilled with a bed mixture that mimics adjacent stream characteristics with attention to channel pattern. The roadway is replaced and any necessary armoring material is placed at the culvert inlet and outlet where it intersects the road fill prism. This scenario does not include additional measures needed to address channel incision, bank stability, and other factors associated with the presence of the stream crossing.RESOURCE CONCERNS: INADEQUATE HABITAT FOR FISH AND WILDLIFE ???Habitat degradation; EXCESS WATER ??? Ponding, flooding, seasonal high water table, seeps, and drifted snow; WATER QUALITY DEGRADATION ??? Elevated water temperature; SOIL EROSION??? Excessive bank erosion from streams shorelines or water conveyance channels. Contract associated practices separately to address site preparation and reclamation in the project footprint: (570) Stormwater Runoff Control, (500) Obstruction Removal, (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment; ---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management, ---Structural Measures outside of project footprint may include: (410) Grade Stabilization Structure, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection

Before Situation:

An existing undersized culvert has contributed to general bed and bank scour downstream of a road crossing. The road may be overtopped by high flows, resulting in outright failure, landowner accessibility problems, access by and to emergency services, and hamper post-flood recovery efforts. An upstream impoundment created by the undersized culvert has contributed to water quality problems including high water temperatures and the deposition and later mobilization of polluted fine sediment.

After Situation:

The undersized culvert is replaced with a concrete box culvert that is sized, placed, and backfilled with material determined by geomorphic analyses. Geomorphic and ecological functions are preserved through the crossing site, enhancing water quality, and culvert longevity. In addition, because the culvert is sized to promote the transport of streamflow and the materials it carries, it requires decreased maintenance activities over time. Landowners are able to access their holdings across a range of flows, and are able to seek and receive emergency and post-flood recovery services. Resource Concerns are addressed within the context of the site. Typical scenario is a 8'x 6' concrete box culvert set on geotextile wrapped rock bedding under a two-lane road 24ft wide with 5ft each shoulder. Includes headwalls and wingwalls with 1ft depth of natural bed material installed inside the box culvert. Culvert is placed to match stream angle - 48 ft feet length is used. Scenario Feature Measure = (8'x6') x 48'=2304 cu.ft.

Feature Measure: Cross Sectional Area of Box Culvert

Scenario Unit: Cubic Feet

Scenario Typical Size: 2,304.00

Scenario Total Cost: $137,492.14

Scenario Cost/Unit: $59.68

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	45	$25,518.60
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	512	$3,200.00
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hours	$145.01	48	$6,960.48
Water management, Flooding & dewatering	969	Includes equipment and power unit. Labor not included.	Acre Feet	$295.73	93	$27,502.89
Auger, Truck Mounted	2049	Truck mounted auger for large diameter excavation. Includes equipment and labor.	Hours	$113.27	2	$226.54
Crane, truck mounted, hydraulic, 80 ton	2569	80 ton capacity truck mounted hydraulic crane. Equipment cost only.	Hours	$349.47	8	$2,795.76
Labor						

Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	32	$1,403.84
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	88	$2,526.48
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	56	$2,247.28
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	40	$1,944.00
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	100	$11,145.00
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement.	Cubic Yards	$136.88	18	$2,463.84
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	512	$14,776.32
Geotextile, non-woven, heavy weight	1210	Non-woven greater than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	$1.89	101	$190.89
Aggregate, gravel, washed, pea gravel	1331	Washed and graded pea gravel river stone. Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$32.50	14.2	$461.50
Aggregate, river rock	1834	Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Ton	$25.51	22	$561.22
Culvert, box, 6 ft x 8 ft	2175	Precast concrete box culvert, 6 feet x 8 feet length. Typically in 4 foot sections. Materials only.	Feet	$442.58	48	$21,243.84
Sign, 3' x 2'	2259	.125 aluminum, single-sided, with nonreflective, EG reflective or HIP reflective face copy. Galvanized perforated square steel tube sign post with 2.5 x 30 inch non-perforated galvanized steel anchor, and Windbeam Bolt Assembly. Includes materials and shipping only.	Each	$223.56	2	$447.12
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	300	$300.00
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	2	$364.16
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	2	$1,846.38
Aggregate, Shipping, Cubic Yard-mile	2360	Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul).	Cubic Yard Mile	$0.42	22300	$9,366.00

Practice: 578 - Stream Crossing

Scenario: #10 - Multi Plate Full Invert Culvert, Area 124 sqft or Less

Scenario Description:

A multi-plate galvanized steel or aluminum culvert (arch or box) used at a road-stream crossing to provide a stream crossing and promote stream ecological and geomorphic function. Due to state regulations larger culverts are typically filled with a mixture of rock and gravel sized to emulate site stream conditions. The simulated streambed material is continuous throughout the culvert barrel, and blended with the intact streambed at the culvert inlet and outlet. Culvert span is selected according to channel bed composition and texture, bank characteristics, channel alignment at the crossing section, and other parameters that may affect channel dynamics and stability. Culvert length is determined by roadway geometry, loading requirements, and site stream conditions. Concrete or multiplate headwalls and wingwalls are typical for this scenario to facilitate a shorter installation which is preferable to limit the structure footprint in the watercourse. Multi plate full invert culverts are commonly delivered in sections and bolted together in the field. Smaller arches can be delivered in one piece. They are installed with an assortment of equipment used for excavation, placing material, and delivering and removing material. Stream dewatering and diversion around the work site is included. Channel bed material within the culvert barrel varies according to prevailing stream characteristics at the crossing site and design velocities if they vary from upstream and downstream natural velocities. The new culvert is set at a slope that matches the design longitudinal profile, and backfilled with a bed mixture that mimics adjacent stream characteristics. Larger rock may be placed along the inside of the pipe as bank material. The roadway is replaced and any necessary armoring material is placed at the culvert inlet and outlet where it intersects the road fill prism. This scenario does not include additional measures needed to address channel incision, bank stability, and other factors associated with the presence of the stream crossing. RESOURCE CONCERNS: INADEQUATE HABITAT FOR FISH AND WILDLIFE ???Habitat degradation; EXCESS WATER ??? Ponding, flooding, seasonal high water table, seeps, and drifted snow; WATER QUALITY DEGRADATION ??? Elevated water temperature; SOIL EROSION??? Excessive bank erosion from streams shorelines or water conveyance channels. Contract associated practices to address site preparation and reclamation associated with project footprint: (570) Stormwater Runoff Control, (500) Obstruction Removal, (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment; ---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management, ---Structural Measures outside of project footprint: (410) Grade Stabilization Structure, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection

Before Situation:

An existing undersized culvert has contributed to general bed and bank scour downstream of a road crossing. The road may be overtopped by high flows, resulting in outright failure, excessive channel erosion, landowner accessibility problems, access by and to emergency services, and hamper post-flood recovery efforts. An upstream impoundment created by the undersized culvert has contributed to water quality problems including high water temperatures and the deposition and later mobilization of polluted fine sediment.

After Situation:

The undersized culvert is replaced with an arch or box multi-plate full invert culvert that is sized, placed, and backfilled with material determined by geomorphic analyses. Geomorphic and ecological functions are preserved through the crossing site, enhancing water quality, and culvert longevity. In addition, because the culvert is sized to promote the transport of streamflow and the materials it carries, it requires decreased maintenance activities over time. Landowners are able to access their holdings across a range of flows, and are able to seek and receive emergency and post-flood recovery services. Resource Concerns are addressed within the context of the site. Typical scenario is a galvanized multi-plate pipe arch structure (7ga.)with a full invert and dimensions of 12'-10' x 8'-4' x 34 total culvert length under a two lane road 24ft wide with two- 5ft each shoulder. Includes headwalls and wingwalls as typical installation. Arch culvert is filled with 1ft depth of natural bed material. Published area of this structure = 85 sqft. Typical scenario = 85sqft. x 34ft =2890 cu.ft.

Feature Measure: Published cross-sect area x (length

Scenario Unit: Cubic Feet

Scenario Typical Size: 2,890.00

Scenario Total Cost: $152,036.85

Scenario Cost/Unit: $52.61

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	77	$43,665.16
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	597	$3,731.25
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hours	$145.01	40	$5,800.40
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$56.88	8	$455.04
Auger, Truck Mounted	2049	Truck mounted auger for large diameter excavation. Includes equipment and labor.	Hours	$113.27	2	$226.54
Crane, truck mounted, hydraulic, 80 ton	2569	80 ton capacity truck mounted hydraulic crane. Equipment cost only.	Hours	$349.47	4	$1,397.88
Sheet Piling, Steel, Temporary	2677	Temporary steel sheet piling, panels or barrier. Driven 22 to 38 psf panels driven 15 to 25 feet extracted and salvaged. Excludes wales. Includes materials, equipment and labor.	Square Feet	$23.19	1000	$23,190.00
Labor						

Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	20	$877.40
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	84	$2,411.64
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	8	$242.88
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	44	$1,765.72
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	24	$1,166.40
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	94	$10,476.30
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement.	Cubic Yards	$136.88	13	$1,779.44
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	597	$17,229.42
Aggregate, river rock	1834	Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Ton	$25.51	24.6	$627.55
Culvert, Multi-Plate arch	1979	Multi-plate arch culvert, typically 7 Gauge corrugated plate. Includes metal arch materials only, does not include footings.	Pound	$1.48	13294	$19,675.12
Sign, 3' x 2'	2259	.125 aluminum, single-sided, with nonreflective, EG reflective or HIP reflective face copy. Galvanized perforated square steel tube sign post with 2.5 x 30 inch non-perforated galvanized steel anchor, and Windbeam Bolt Assembly. Includes materials and shipping only.	Each	$223.56	2	$447.12
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	750	$750.00
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	2	$364.16
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	2	$1,846.38
Aggregate, Shipping, Cubic Yard-mile	2360	Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul).	Cubic Yard Mile	$0.42	31301	$13,146.42

Practice: 578 - Stream Crossing

Scenario: #14 - Hard armored or Paved Stream Crossing

Scenario Description:
Stabilize the bottom and slope of a stream channel using rock riprap or cast in place concrete. This scenario includes site preparation, dewatering, acquiring and installing gravel or geotextile with rock riprap or cast in place concrete on channel bottom and approaches. Final travel surface shall be the rocks or concrete. If a different travel surface is needed, refer to another appropriate standard for the surfacing. Typical stream is 3 ft deep with a 30 foot bottom width, 6:1 approaches. Width is 14 feet for a total crossing area 76.4 ft total length x 14 ft wide = 1069.6. Use (396) Aquatic Organism Passage instead, when the primary intent is biological concerns, not hydrologic.

Before Situation:
Water flow could not cross access road or trail without erosion; or access road or trail could not cross channel.

After Situation:
Stream flow is not impeded and a stable base exists for equipment, people and/or animals to cross. Associated practices could be (342) Critical Area Planting, (560) Access Road, (575) Animal Trails and Walkways, (566) Recreational Trails and Walkways, (500) Obstruction Removal, or (584) Channel Stabilization.

Feature Measure: Crossing dimensions (width x total l

Scenario Unit: Square Feet

Scenario Typical Size: 1,069.00

Scenario Total Cost: $11,775.88

Scenario Cost/Unit: $11.02

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hours	$145.01	7	$1,015.07
Truck, dump, 12 CY	1215	Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only.	Hours	$104.69	4	$418.76
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	11	$441.43
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement.	Cubic Yards	$136.88	60	$8,212.80
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 578 - Stream Crossing

Scenario: #15 - Bridge, Manufactured, Foundation Modification

Scenario Description:

A channel-spanning structure constructed from a manufactured concrete or steel bridge structure that has been certified by a PE that carries a road or trailway across a river or stream. Bridge design is completed to conform to loading requirements and site conditions. The bridge deck is designed to rest on abutments placed on the adjacent floodplain. Projects located in alluvial, estuarine, or tidally influenced areas, where soils are considered 'soft' with low bearing capacity and high potential for settlement or consolidation. These projects typically require a large quantity of over-excavation to remove unsuitable soils, backfill with engineered fill material, and manual compaction to support a new structure. Bridge components are delivered to the site and assembled by a combination of equipment and manual labor. They are installed with an assortment of equipment used for excavation, placing material, delivering and removing material, and lifting bridge components from delivery trucks onto the constructed bridge support elements. Other actions include construction staking and signage. Scenario does not include additional measures needed to address channel incision, bank stability, and other factors associated with the presence of the bridge crossing. RESOURCE CONCERNS: INADEQUATE HABITAT FOR FISH AND WILDLIFE ???Habitat degradation; EXCESS WATER ??? Ponding, flooding, seasonal high water table, seeps, and drifted snow; WATER QUALITY DEGRADATION ??? Elevated water temperature; SOIL EROSION??? Excessive bank erosion from streams shorelines or water conveyance channels. Contract associated Practices to address site preparation and reclamation associated with project footprint: (570) Storm Runoff Control, (500) Obstruction Removal, (326) Clearing and Snagging, (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment; (395) Stream Habitat Improvement and Management, (410) Grade Stabilization Structure, (582) Open Channel, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection

Before Situation:

An existing undersized culvert creates an upstream crossing flooding, bank scour downstream of a road crossing. The road may be overtopped by high flows, resulting in outright failure, excessive channel erosion, landowner accessibility problems, access by and to emergency services, and hamper post-flood recovery efforts. An upstream impoundment created by the undersized culvert has contributed to water quality problems including high water temperatures and the deposition and later mobilization of polluted fine sediment. Due to site soil conditions a culvert is not appropriate.

After Situation:

The undersized culvert is replaced with a manufactured bridge placed on precast concrete abutments. The bridge deck is composed of concrete or steel and elevated, continuous railings run down each side connecting one abutment to its counterpart on the opposite bank. Signs on either approach indicate bridge capacity and weight restrictions. Because the bridge spans the active channel and sits atop the adjacent floodplain surface, geomorphic and ecological functions are preserved through the crossing site, enhancing water quality, and culvert longevity. Resource Concerns are addressed within the context of the site. Typical Scenario is for a 30' span bridge 15' wide on precast concrete abutments.

Feature Measure: Linear feet of bridge deck, length-w

Scenario Unit: Linear Feet

Scenario Typical Size: 30.00

Scenario Total Cost: $115,479.71

Scenario Cost/Unit: $3,849.32

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	18	$10,207.44
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.11	67	$74.37
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	154	$962.50
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	80	$5,294.40
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hours	$145.01	20	$2,900.20
Water management, Flooding & dewatering	969	Includes equipment and power unit. Labor not included.	Acre Feet	$295.73	50	$14,786.50
Truck, dump, 12 CY	1215	Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only.	Hours	$104.69	40	$4,187.60
Auger, Truck Mounted	2049	Truck mounted auger for large diameter excavation. Includes equipment and labor.	Hours	$113.27	2	$226.54
Crane, truck mounted, hydraulic, 100 ton	2570	100 ton capacity truck mounted hydraulic crane. Equipment cost only.	Hours	$366.20	20	$7,324.00
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	34	$1,491.58
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	124	$3,560.04

Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	160	$6,420.80
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	40	$1,944.00
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	80	$8,916.00
Materials						
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$23.32	119	$2,775.08
Geocell, 6 inch	1842	6-inch thick cellular confinement system, three-dimensional, expandable panels made from high-density polyethylene (HDPE), polyester or another polymer material. Includes materials, labor and equipment for the geocell only, does not include backfill.	Square Yard	$27.61	67	$1,849.87
Bridge, steel or concrete, pre-Manufactured Bridge	2193	A premanufactured steel or precast prestressed concrete bridge rated for an HS 25 highway loading. Typical width is 14 ft., length is variable. Includes railing system. Includes materials and shipping only.	Square Feet	$79.75	450	$35,887.50
Sign, 3' x 2'	2259	.125 aluminum, single-sided, with nonreflective, EG reflective or HIP reflective face copy. Galvanized perforated square steel tube sign post with 2.5 x 30 inch non-perforated galvanized steel anchor, and Windbeam Bolt Assembly. Includes materials and shipping only.	Each	$223.56	2	$447.12
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	750	$750.00
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	2	$364.16
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	2	$1,846.38
Aggregate, Shipping, Cubic Yard-mile	2360	Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul).	Cubic Yard Mile	$0.42	5950	$2,499.00

Practice: 578 - Stream Crossing

Scenario: #18 - CMP Culvert, > 48 inch to <= 96 inch Diameter

Scenario Description:

A corrugated metal (galvanized steel or aluminum) pipe culvert (CMP) of any shape (round, elliptical, or squash) used at a road-stream crossing to provide a stream crossing and promote stream ecological and geomorphic function. Due to state regulations larger CMPs are typically filled with a mixture of rock and gravel sized to emulate site stream conditions. The simulated streambed material is continuous throughout the culvert barrel, and blended with the intact streambed at the culvert inlet and outlet. Culvert diameter or span is determined according to channel bed composition and texture, bank characteristics, channel alignment at the crossing section, and other parameters that may affect channel dynamics and stability. The culvert length is determined by roadway geometry, loading requirements, and site stream conditions. Concrete headwalls and wingwalls are NOT included in this scenario. CMPs are installed with an assortment of equipment used for excavation, placing material, and delivering and removing material. Stream dewatering and diversion around the work site is included. Channel bed material within the culvert barrel varies according to prevailing stream characteristics at the crossing site. The culvert is placed within the roadway on a sub-excavated compacted bed, set at a slope that matches the design longitudinal profile, and backfilled with a bed mixture that mimics adjacent stream characteristics. Special equipment such as motorized wheelbarrows may be necessary to backfill smaller CMPs. Once the simulated streambed in the culvert barrel is complete, the roadway is replaced and any necessary armoring material is placed at the culvert inlet and outlet where it intersects the road fill prism. This scenario does not include additional measures needed to address channel incision, bank stability, and other factors associated with the presence of the stream crossing.RESOURCE CONCERNS: INADEQUATE HABITAT FOR FISH AND WILDLIFE ???Habitat degradation; EXCESS WATER ??? Ponding, flooding, seasonal high water table, seeps, and drifted snow; WATER QUALITY DEGRADATION ??? Elevated water temperature; SOIL EROSION??? Excessive bank erosion from streams shorelines or water conveyance channels Contract associated practices separately to address site preparation and reclamation in the project footprint: (500) Obstruction Removal, (570) Stormwater Runoff Control, (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover,(391) Riparian Forest Buffer, (612) Tree/Shrub Establishment; ---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management, --- Structural Measures Associated with Scenario but outside of project footprint: (410) Grade Stabilization Structure, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection

Before Situation:

An existing undersized culvert has contributed to general bed and bank scour downstream of a road crossing. The road may be overtopped by high flows, resulting in outright failure, landowner accessibility problems, access by and to emergency services, and hamper post-flood recovery efforts. An upstream impoundment created by the undersized culvert has contributed to water quality problems including high water temperatures and the deposition and later mobilization of polluted fine sediment.

After Situation:

The undersized culvert is replaced with a CMP sized, placed, and backfilled with material determined by geomorphic analyses. Geomorphic and ecological functions are preserved through the crossing site, enhancing water quality, and culvert longevity. In addition, because the culvert is sized to promote the transport of streamflow and the materials it carries, it requires decreased maintenance activities over time. Landowners are able to access their holdings across a range of flows, and are able to seek and receive emergency and post-flood recovery services. Resource Concerns are addressed within the context of the site. Typical scenario is an 6 ft (72 inch) diameter (28.3 square feet) 12 ga. galvanized corrugated metal pipe, under a road. 60 feet of culvert is needed. Scenario unit is cubic feet = cross-sectional area of culvert; square feet x (total length of culvert needed). Natural bed material is placed in the pipe to bankfull width. Typical scenario = 28.3 sq.ft x 60 ft= 1698 cubic feet

Feature Measure: Cross-sectional area of culvert x Le

Scenario Unit: Cubic Feet

Scenario Typical Size: 1,698.00

Scenario Total Cost: $64,568.65

Scenario Cost/Unit: $38.03

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	391	$2,443.75
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hours	$145.01	24	$3,480.24
Water management, Flooding & dewatering	969	Includes equipment and power unit. Labor not included.	Acre Feet	$295.73	84	$24,841.32
Auger, Truck Mounted	2049	Truck mounted auger for large diameter excavation. Includes equipment and labor.	Hours	$113.27	2	$226.54
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	56	$1,607.76
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	24	$963.12
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement.	Cubic Yards	$136.88	11	$1,505.68
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	391	$11,284.26

Aggregate, gravel, washed, pea gravel	1331	Washed and graded pea gravel river stone. Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$32.50	14	$455.00
Pipe, CMP, 14-12 gauge, weight priced	1589	14 and 12 gauge galvanized helical corrugated metal pipe priced by the weight of the pipe materials. Materials only.	Pound	$0.93	6600	$6,138.00
Aggregate, river rock	1834	Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Ton	$25.51	19	$484.69
Sign, 3' x 2'	2259	.125 aluminum, single-sided, with nonreflective, EG reflective or HIP reflective face copy. Galvanized perforated square steel tube sign post with 2.5 x 30 inch non-perforated galvanized steel anchor, and Windbeam Bolt Assembly. Includes materials and shipping only.	Each	$223.56	2	$447.12
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	600	$600.00
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19
Aggregate, Shipping, Cubic Yard-mile	2360	Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul).	Cubic Yard Mile	$0.42	21395	$8,985.90

Practice: 578 - Stream Crossing

Scenario: #19 - CMP Culvert, Greater Than 96 inch Diameter

Scenario Description:

A corrugated metal (galvanized steel or aluminum) pipe culvert (CMP) of any shape (round, elliptical, or squash) used at a road-stream crossing to provide a stream crossing and promote stream ecological and geomorphic function. Due to state regulations large CMPs are typically filled with a mixture of rock and gravel sized to emulate site stream conditions. The simulated streambed material is continuous throughout the culvert barrel, and blended with the intact streambed at the culvert inlet and outlet. Culvert diameter or span is determined according to channel bed composition and texture, bank characteristics, channel alignment at the crossing section, and other parameters that may affect channel dynamics and stability. The culvert length is determined by roadway geometry, loading requirements, and site stream conditions. Concrete headwalls and wingwalls are typical for this scenario to facilitate a shorter installation which is perferable to limit the strucutre footprint in the watercourse. CMPs are installed with an assortment of equipment used for excavation, placing material, and delivering and removing material. Stream dewatering and diversion around the work site is included. Channel bed material within the culvert barrel varies according to prevailing stream characteristics at the crossing site. The culvert is placed within the roadway on a subexcavated compacted bed, set at a slope that matches the design longitudinal profile, and backfilled with a bed mixture that mimics adjacent stream characteristics. Once the simulated streambed in the culvert barrel is complete, the roadway is replaced and any necessary armoring material is placed at the culvert inlet and outlet where it intersects the road fill prism. Scenario does not include additional measures needed to address channel incision, bank stability, and other factors associated with the presence of the stream crossing.RESOURCE CONCERNS: INADEQUATE HABITAT FOR FISH AND WILDLIFE ???Habitat degradation; EXCESS WATER ??? Ponding, flooding, seasonal high water table, seeps, and drifted snow; WATER QUALITY DEGRADATION ??? Elevated water temperature; SOIL EROSION??? Excessive bank erosion from streams shorelines or water conveyance channels Contract associated practices separately to address site preparation and reclamation in the project footprint: (570) Stormwater Runoff Control, (500) Obstruction Removal, (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment; ---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management, --- Structural Measures outside of project footprint may include: (410) Grade Stabilization Structure, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection

Before Situation:

An existing undersized culvert has contributed to general bed and bank scour downstream of a road crossing. The road may be overtopped by high flows, resulting in outright failure, landowner accessibility problems, access by and to emergency services, and hamper post-flood recovery efforts. An upstream impoundment created by the undersized culvert has contributed to water quality problems including high water temperatures and the deposition and later mobilization of polluted fine sediment.

After Situation:

The undersized culvert is replaced with a CMP sized, placed, and backfilled with material determined by geomorphic analyses. Geomorphic and ecological functions are preserved through the crossing site, enhancing water quality, and culvert longevity. In addition, because the culvert is sized to promote the transport of streamflow and the materials it carries, it requires decreased maintenance activities over time. Landowners are able to access their holdings across a range of flows, and are able to seek and receive emergency and post-flood recovery services. Resource Concerns are addressed within the context of the site. Typical scenario is a 10ft (120 inch) diameter (78.5 square feet) 12ga. galvanized metal pipe ,under a two-lane road 24ft wide with two -5 ft shoulders (total length of culvert needed is 34 ft). Scenario unit is cubic feet using the CMP cross sectional area; square feet x Length of culvert. Natural bed material placed in the culvert to bankfull width. Feature Measure is = 78.5sqft x 34 ft =2,669 cubic feet

Feature Measure: cross-sectional area of culvert x Len

Scenario Unit: Cubic Feet

Scenario Typical Size: 2,669.00

Scenario Total Cost: $121,074.86

Scenario Cost/Unit: $45.36

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	77	$43,665.16
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	523	$3,268.75
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hours	$145.01	32	$4,640.32
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$56.88	2	$113.76
Water management, Flooding & dewatering	969	Includes equipment and power unit. Labor not included.	Acre Feet	$295.73	84	$24,841.32
Auger, Truck Mounted	2049	Truck mounted auger for large diameter excavation. Includes equipment and labor.	Hours	$113.27	2	$226.54
Crane, truck mounted, hydraulic, 80 ton	2569	80 ton capacity truck mounted hydraulic crane. Equipment cost only.	Hours	$349.47	2	$698.94
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	56	$1,607.76

Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	2	$60.72
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	34	$1,364.42
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement.	Cubic Yards	$136.88	23	$3,148.24
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	523	$15,093.78
Aggregate, gravel, washed, pea gravel	1331	Washed and graded pea gravel river stone. Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$32.50	10	$325.00
Pipe, CMP, 14-12 gauge, weight priced	1589	14 and 12 gauge galvanized helical corrugated metal pipe priced by the weight of the pipe materials. Materials only.	Pound	$0.93	6222	$5,786.46
Aggregate, river rock	1834	Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Ton	$25.51	18	$459.18
Sign, 3' x 2'	2259	.125 aluminum, single-sided, with nonreflective, EG reflective or HIP reflective face copy. Galvanized perforated square steel tube sign post with 2.5 x 30 inch non-perforated galvanized steel anchor, and Windbeam Bolt Assembly. Includes materials and shipping only.	Each	$223.56	2	$447.12
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	600	$600.00
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	2	$1,846.38
Aggregate, Shipping, Cubic Yard-mile	2360	Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul).	Cubic Yard Mile	$0.42	28415	$11,934.30

Practice: 578 - Stream Crossing

Scenario: #20 - CMP Culvert, > 48 inch to <= 96 inch Diameter with Concrete Headwall and Wingwalls

Scenario Description:

A corrugated metal (galvanized steel or aluminum) pipe culvert (CMP) of any shape (round, elliptical, or squash) used at a road-stream crossing to a provide stream crossing and promote stream ecological and geomorphic function. Due to state regulations larger CMPs are typically filled with a mixture of rock and gravel sized to emulate site stream conditions. The simulated streambed material is continuous throughout the culvert barrel, and blended with the intact streambed at the culvert inlet and outlet. Culvert diameter or span is determined according to channel bed composition and texture, bank characteristics, channel alignment at the crossing section, and other parameters that may affect channel dynamics and stability. The culvert length is determined by roadway geometry, loading requirements, and site stream conditions. Concrete headwalls and/or wingwalls are typical for this scenario to facilitate a shorter installations which is perferable to limit the structure footprint in the watercourse. CMPs are installed with an assortment of equipment used for excavation, placing material, and delivering and removing material. Stream dewatering and diversion around the work site is include. Channel bed material within the culvert barrel varies according to prevailing stream characteristics at the crossing site. The culvert is placed within the roadway on a sub-excavated compacted bed, set at a slope that matches the design longitudinal profile, and backfilled with a bed mixture that mimics adjacent stream characteristics. Special equipment such as motorized wheelbarrows may be necessary to backfill smaller CMPs. Once the simulated streambed in the culvert barrel is complete, the roadway is replaced and any necessary armoring material is placed at the culvert inlet and outlet where it intersects the road fill prism. This scenario does not include additional measures needed to address channel incision, bank stability, and other factors associated with the presence of the stream crossing.RESOURCE CONCERNS: INADEQUATE HABITAT FOR FISH AND WILDLIFE ???Habitat degradation; EXCESS WATER ??? Ponding, flooding, seasonal high water table, seeps, and drifted snow; WATER QUALITY DEGRADATION ??? Elevated water temperature; SOIL EROSION??? Excessive bank erosion from streams shorelines or water conveyance channels. Contract associated practices separately to adddress site preparation and reclamation associated with project footprint: (570) Stormwater Runoff Control, (500) Obstruction Removal, (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment; ---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management, ---Structural Measures outside of project footprint may include: (410) Grade Stabilization Structure, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection

Before Situation:

An existing undersized culvert has contributed to general bed and bank scour downstream of a road crossing. The road may be overtopped by high flows, resulting in outright failure, landowner accessibility problems, access by and to emergency services, and hamper post-flood recovery efforts. An upstream impoundment created by the undersized culvert has contributed to water quality problems including high water temperatures and the deposition and later mobilization of polluted fine sedi

After Situation:

The undersized culvert is replaced with a CMP sized, placed, and backfilled with material determined by geomorphic analyses. Geomorphic and ecological functions are preserved through the crossing site, enhancing water quality, and culvert longevity. In addition, because the culvert is sized to promote the transport of streamflow and the materials it carries, it requires decreased maintenance activities over time. Landowners are able to access their holdings across a range of flows, and are able to seek and receive emergency and post-flood recovery services. Resource Concerns are addressed within the context of the site. Typical scenario is an 6 ft (72 inch) diameter (28.3 square feet) 12 ga. galvanized corrugated metal pipe, under a two-lane road 24 ft wide with two - 5 ft. shoulders = 34 feet needed culvert length. The ends of the culvert include headwalls and wingwalls. Scenario unit is cubic feet = cross-sectional area of culvert; square feet x Length of Culvert. Natural bed material is placed in the pipe to bankfull width. Typical scenario = 28.3 sq.ft x 34 ft= 962.2 cubic feet use 963 cubic feet

Feature Measure: Cross-sectional area of culvert x Le

Scenario Unit: Cubic Feet

Scenario Typical Size: 963.00

Scenario Total Cost: $78,270.37

Scenario Cost/Unit: $81.28

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	47	$26,652.76
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	391	$2,443.75
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hours	$145.01	24	$3,480.24
Water management, Flooding & dewatering	969	Includes equipment and power unit. Labor not included.	Acre Feet	$295.73	84	$24,841.32
Auger, Truck Mounted	2049	Truck mounted auger for large diameter excavation. Includes equipment and labor.	Hours	$113.27	2	$226.54
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	56	$1,607.76
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	24	$963.12
Materials						

Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement.	Cubic Yards	$136.88	9	$1,231.92
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	391	$11,284.26
Aggregate, gravel, washed, pea gravel	1331	Washed and graded pea gravel river stone. Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$32.50	7	$227.50
Pipe, CMP, 14-12 gauge, weight priced	1589	14 and 12 gauge galvanized helical corrugated metal pipe priced by the weight of the pipe materials. Materials only.	Pound	$0.93	3740	$3,478.20
Aggregate, river rock	1834	Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Ton	$25.51	11	$280.61
Sign, 3' x 2'	2259	.125 aluminum, single-sided, with nonreflective, EG reflective or HIP reflective face copy. Galvanized perforated square steel tube sign post with 2.5 x 30 inch non-perforated galvanized steel anchor, and Windbeam Bolt Assembly. Includes materials and shipping only.	Each	$223.56	2	$447.12
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 578 - Stream Crossing

Scenario: #21 - Bridge: Timber Decking, Timber Supports, Timber Pilings

Scenario Description:

A channel-spanning structure that carries a road or trail way across a river or stream. Constructed of prefabricated timber deck sections, bridges are attached at either end to timber piling abutments. Longer span bridges may require instream pilings to support the travel surface. Timber bridge decking is typically covered in asphalt surfacing which is not included in this scenario. Bridge design shop drawings are completed to conform to loading requirements and site conditions. Geotechnical investigations are used to determine the piling supports needed. Timber abutments are spaced to span the bankfull channel width at a minimum. Bridge components are delivered to the site and assembled by a combination of equipment and manual labor. They are installed with an assortment of equipment used for pile driving, excavation, placing material, delivering and removing material, and lifting bridge components from delivery trucks onto the constructed bridge support elements. Rock riprap over geotextile is placed on the stream side of the timber abutments as scour protection. Scenario does not include additional measures needed to address channel incision, bank stability, and other factors associated with the presence of the bridge crossing. RESOURCE CONCERNS: INADEQUATE HABITAT FOR FISH AND WILDLIFE ???Habitat degradation; EXCESS WATER ??? Ponding, flooding, seasonal high water table, seeps, and drifted snow; WATER QUALITY DEGRADATION ??? Elevated water temperature; SOIL EROSION??? Excessive bank erosion from streams shorelines or water conveyance channels Contract associated practices separately To address site preparation and reclamation associated with project footprint: (570) Stormwater Runoff Control, (500) Obstruction Removal, (326) Clearing and Snagging, (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment; ---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management, ---Structural Measures outside of project footprint may include: (410) Grade Stabilization Structure, (582) Open Channel, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection

Before Situation:

An existing stream crossing is outfitted with an undersized culvert has a history of maintenance issues and failure. The downstream channel has experienced bed and bank scour. The road may be overtopped by high flows, resulting in outright failure, landowner accessibility problems, access by and to emergency services, and hamper post-flood recovery efforts. An upstream impoundment created by the undersized culvert has contributed to water quality problems including high water temperatures and the deposition and later mobilization of polluted fine sediment.

After Situation:

The undersized culvert is replaced with a timber bridge placed on timber pilings. The bridge deck is composed of prefabricated timber panel decking, placed on timber beams and elevated, continuous railings run down each side connecting one abutment to its counterpart on the opposite bank. Signs on either approach indicate bridge capacity and weight restrictions. Because the bridge spans the active channel and sits atop the adjacent floodplain surface, geomorphic and ecological functions are preserved through the crossing site, enhancing water quality, and culvert longevity. Landowners are able to access their holdings across a range of flows, and are able to seek and receive emergency and post-flood recovery services. Resource Concerns are addressed within the context of the site. The typical scenario is a prefabricated timber bridge structure assembled on site and supported by timber pilings. The typical dimensions are a 20ft span, with a 20ft wide clear deck width with timber railings and total abutment height of 6 ft (2ft below grade and 4 ft above grade), the stream bankfull width is 20ft. Typical Scenario= 20ft x 20ft x 6ft = 2400 cu.ft.

Feature Measure: Bankfull Width x Clear Deck Bridge

Scenario Unit: Cubic Feet

Scenario Typical Size: 2,400.00

Scenario Total Cost: $134,297.26

Scenario Cost/Unit: $55.96

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	53	$331.25
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hours	$145.01	40	$5,800.40
Water management, Flooding & dewatering	969	Includes equipment and power unit. Labor not included.	Acre Feet	$295.73	30	$8,871.90
Auger, Truck Mounted	2049	Truck mounted auger for large diameter excavation. Includes equipment and labor.	Hours	$113.27	2	$226.54
Crane, truck mounted, hydraulic, 100 ton	2570	100 ton capacity truck mounted hydraulic crane. Equipment cost only.	Hours	$366.20	40	$14,648.00
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	96	$4,211.52
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	112	$3,215.52
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	80	$3,210.40
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	48	$2,332.80

Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	125	$13,931.25
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement.	Cubic Yards	$136.88	24	$3,285.12
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	53	$1,529.58
Lumber, planks, posts and timbers, treated	1609	Treated dimension lumber with nominal thickness greater than 2 inches. Includes lumber and fasteners. Does not include labor.	Board Feet	$3.53	1440	$5,083.20
Sign, 3' x 2'	2259	.125 aluminum, single-sided, with nonreflective, EG reflective or HIP reflective face copy. Galvanized perforated square steel tube sign post with 2.5 x 30 inch non-perforated galvanized steel anchor, and Windbeam Bolt Assembly. Includes materials and shipping only.	Each	$223.56	2	$447.12
Structural Timber Piles, Treated Timber Bridge	2583	Timber Piles for timber bridge abutments, Includes materials only.	Board Feet	$2.75	23336	$64,174.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	2	$1,846.38
Aggregate, Shipping, Cubic Yard-mile	2360	Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul).	Cubic Yard Mile	$0.42	2310	$970.20

Practice: 578 - Stream Crossing

Scenario: #24 - CMP, Any Shape Culvert > 25 in to <= 48 in Diameter

Scenario Description:

Install a new culvert. Work includes; site preparation, installation of culvert pipe with gravel bedding and fill (compacted), and building headwalls. If a different travel surface is needed, refer to another appropriate standard for the surfacing. 36 inch culvert installation with 40 cy of fill needed and 2 yds rock riprap for headwalls. Pipe is 36 feet long. Use (396) Aquatic Organism Passage instead, when the primary intent is biological concerns, not hydrologic.

Before Situation:

Water flow could not cross access road or trail without erosion; or access road or trail could not cross channel.

After Situation:

Access road and waterflow are able to cross each other in a stable manner. Stream flow is not impeded and a stable base exists for equipment, people and/or animals to cross. Associated practices could be (342) Critical Area Planting, (560) Access Road, (575) Animal Trails and Walkways, (566) Recreational Trails and Walkways, (500) Obstruction Removal, (570) Stormwater Runoff Control, or (584) Channel Stabilization. Typical scenario is an 3 ft (36 inch) diameter (7.1 square feet) 12 ga. galvanized corrugated metal pipe, under a 16ft access road. 34 feet of culvert is needed. Scenario unit is cubic feet = cross-sectional area of culvert; square feet x (total length of culvert needed). Natural bed material is placed in the pipe to bankfull width. Typical scenario size = 7.1 sq.ft x 34 ft= 241.4 cubic feet

Feature Measure: Cross-sectional area of culvert x Le

Scenario Unit: Cubic Feet

Scenario Typical Size: 241.00

Scenario Total Cost: $15,110.15

Scenario Cost/Unit: $62.70

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	76	$475.00
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hours	$145.01	16	$2,320.16
Water management, Flooding & dewatering	969	Includes equipment and power unit. Labor not included.	Acre Feet	$295.73	12	$3,548.76
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	32	$918.72
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	16	$642.08
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement.	Cubic Yards	$136.88	5	$684.40
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	76	$2,193.36
Aggregate, gravel, washed, pea gravel	1331	Washed and graded pea gravel river stone. Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$32.50	5	$162.50
Pipe, CMP, 14-12 gauge, weight priced	1589	14 and 12 gauge galvanized helical corrugated metal pipe priced by the weight of the pipe materials. Materials only.	Pound	$0.93	1224	$1,138.32
Aggregate, river rock	1834	Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Ton	$25.51	6	$153.06
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	800	$800.00
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	2	$364.16
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Aggregate, Shipping, Cubic Yard-mile	2360	Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul).	Cubic Yard Mile	$0.42	2250	$945.00

Practice: 580 - Streambank and Shoreline Protection

Scenario: #1 - Stream Barb

Scenario Description:

Protection of streambanks using stream barbs to protect banks of streams or excavated channels against scour and erosion. The purpose of this practice is to maintain, improve, or restore physical, chemical, and biological functions of a stream to provide diverse aquatic communities to improve habitat for desired aquatic species. Payment cost include shaping bank and rock stream barb, 50 cubic yards is used for estimation purposes. The bank around the barb will be graded to a stable slope.Resource Concerns: Soil Erosion - Excessive Bank Erosion from Streams, Shoreline and Water Conveyance Channels; Water Quality Degradation - Excessive Sediment in Surface Waters; Water Quality Degradation - Elevated Water Temperature; Excess/Insufficient Water - Excessive Sediment in Surface Waters; Inadequate Habitat for Fish and Wildlife- Habitat Degradation.Associated Practices include: 560 - Access Road; 342 - Critical Area Planting; 382 - Fence; 391 - Riparian Forest Buffer; 390 - Riparian Herbaceous Cover; 395 - Stream Habitat Improvement and Management; 614 - Watering Facility

Before Situation:

A stream bisects the agricultural property and has had all of the woody vegetation removed due to overgrazing or human manipulation; the stream has severely degraded streambanks that are unstable and show signs of active erosion. Soil Erosion: The streambank is unstable.Water Quality Degradation: The sediment load has increased in the stream resulting in elevated water temperatures.Excess/Insufficient Water: The excessive sediment load has reduced the water conveyance capacity, storage capacity and flow within the stream.Inadequate Habitat for Fish and Wildlife: The deficiencies in the stream's habitat limit survival, growth, reproduction, and/or diversity of aquatic organisms within the stream.

After Situation:

The streambank is stable against further erosion and encourages natural sediment transport and deposition. Loss of riparian areas and sediment load is reduced in the stream.For Soil Erosion: The streambank is stable.For Water Quality Degradation: The sediment load has decreased in the stream resulting in improved aquatic habitat.For Excess/Insufficient Water: The water conveyance capacity, storage capacity and flow within the stream has been stabilized.For Inadequate Habitat for Fish and Wildlife: The reduction in the sediment load promotes survival, growth, reproduction, and/or diversity of aquatic organisms within the stream's habitat.

Feature Measure: Stream Barb

Scenario Unit: Cubic Yards

Scenario Typical Size: 50.00

Scenario Total Cost: $8,076.17

Scenario Cost/Unit: $161.52

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	2	$261.02
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	3	$86.13
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	3	$120.39
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement.	Cubic Yards	$136.88	50	$6,844.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 580 - Streambank and Shoreline Protection

Scenario: #2 - Bioengineered

Scenario Description:

Protection of streambanks consisting of a bioengineered technique comprised of non-structural measures such as earth revetments and benches with vegetative measures to stabilize and protect the streambank against scour and erosion. Soil bioengineering is a system of living plant materials used as structural components. Adapted types of woody vegetation (shrubs and trees) are initially installed in specified configurations that offer immediate soil protection and reinforcement. In addition, soil bioengineering systems create resistance to sliding or shear displacement in a streambank as they develop roots or fibrous inclusions. Environmental benefits derived from woody vegetation include diverse and productive riparian habitats, shade, organic additions to the stream, cover for fish, and improvements in aesthetic value and water quality. Under certain conditions, soil bioengineering installations work well in conjunction with structures to provide more permanent protection and healthy function, enhance aesthetics, and create a more environmentally acceptable product. Soil bioengineering systems normally use unrooted plant parts in the form of cut branches and rooted plants. For streambanks, living systems include brushmattresses, live stakes, joint plantings, vegetated geogrids, branchpacking, and live fascines. The purpose of this practice is to maintain, improve, or restore physical, chemical, and biological functions of a stream to provide diverse aquatic communities to improve habitat for desired aquatic species. Payment cost include shaping bank, critical area vegetation, livestake, rootwads and revetments: a 6-foot high bank at 3(H):1(V) slope for 500 linear feet (0.23 acres) is used for estimation purposes. Resource Concerns: Soil Erosion - Excessive Bank Erosion from Streams, Shoreline and Water Conveyance Channels; Water Quality Degradation - Excessive Sediment in Surface Waters; Water Quality Degradation - Elevated Water Temperature; Excess/Insufficient Water - Excessive Sediment in Surface Waters; Inadequate Habitat for Fish and Wildlife- Habitat Degradation.Associated Practices include: 560 - Access Road; 342 - Critical Area Planting; 382 - Fence; 391 - Riparian Forest Buffer; 390 - Riparian Herbaceous Cover; 395 - Stream Habitat Improvement and Management; 614 - Watering Facility; 484-Mulching; 570-Stormwater Runoff Control.

Before Situation:

A stream bisects the agricultural property and has had all of the woody vegetation removed due to overgrazing or human manipulation; the stream has moderately degraded streambanks that are unstable and show signs of active erosion. Soil Erosion: The streambank is unstable.Water Quality Degradation: The sediment load has increased in the stream resulting in elevated water temperatures.Excess/Insufficient Water: The excessive sediment load has reduced the water conveyance capacity, storage capacity and flow within the stream.Inadequate Habitat for Fish and Wildlife: The deficiencies in the stream's habitat limit survival, growth, reproduction, and/or diversity of aquatic organisms within the stream.

After Situation:

The streambank is stable against further erosion and encourages natural sediment transport and deposition. Loss of riparian areas and sediment load is reduced in the stream.For Soil Erosion: The streambank is stable.For Water Quality Degradation: The sediment load has decreased in the stream resulting in improved aquatic habitat.For Excess/Insufficient Water: The water conveyance capacity, storage capacity and flow within the stream has been stabilized.For Inadequate Habitat for Fish and Wildlife: The reduction in the sediment load promotes survival, growth, reproduction, and/or diversity of aquatic organisms within the stream's habitat.

Feature Measure: Linear Feet of Streambank/Shorelin

Scenario Unit: Feet

Scenario Typical Size: 500.00

Scenario Total Cost: $15,097.05

Scenario Cost/Unit: $30.19

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	8	$626.40
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	25	$3,262.75
Seeding Operation, Broadcast, Ground	959	Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs.	Acres	$14.02	0.23	$3.22
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	185	$5,311.35
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	8	$242.88
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	25	$1,003.25
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	40	$1,944.00
Materials						
Tree, Hardwood, Seedling, Medium	1510	Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only.	Each	$1.74	500	$870.00
Mobilization						

Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 580 - Streambank and Shoreline Protection

Scenario: #3 - Riprap on bank less than 4 ft high measure from bank top to toe of slope

Scenario Description:

Protection of streambanks using structural measures such as riprap, concrete block, gabions, etc. to stabilize and protect banks of streams or excavated channels against scour and erosion. The purpose of this practice is to maintain, improve, or restore physical, chemical, and biological functions of a stream to provide diverse aquatic communities to improve habitat for desired aquatic species. Payment cost include shaping bank and rock rip rap; a 3.5-foot high bank at 2(H):1(V) slope for 500 linear feet is used for estimation purposes. The rock toe will be 1.5' thick and 3' high. The bank above the riprap will be graded to a stable slope and seeded and mulched.Resource Concerns: Soil Erosion - Excessive Bank Erosion from Streams, Shoreline and Water Conveyance Channels; Water Quality Degradation - Excessive Sediment in Surface Waters; Water Quality Degradation - Elevated Water Temperature; Excess/Insufficient Water - Excessive Sediment in Surface Waters; Inadequate Habitat for Fish and Wildlife- Habitat Degradation.Associated Practices include: 560 - Access Road; 382 - Fence; 391 - Riparian Forest Buffer; 390 - Riparian Herbaceous Cover; 395 - Stream Habitat Improvement and Management; 614 - Watering Facility

Before Situation:

A stream bisects the agricultural property and has had all of the woody vegetation removed due to overgrazing or human manipulation; the stream has severely degraded streambanks that are unstable and show signs of active erosion. Soil Erosion: The streambank is unstable.Water Quality Degradation: The sediment load has increased in the stream resulting in elevated water temperatures.Excess/Insufficient Water: The excessive sediment load has reduced the water conveyance capacity, storage capacity and flow within the stream.Inadequate Habitat for Fish and Wildlife: The deficiencies in the stream's habitat limit survival, growth, reproduction, and/or diversity of aquatic organisms within the stream.

After Situation:

The streambank is stable against further erosion and encourages natural sediment transport and deposition. Loss of riparian areas and sediment load is reduced in the stream.For Soil Erosion: The streambank is stable.For Water Quality Degradation: The sediment load has decreased in the stream resulting in improved aquatic habitat. For excess/Insufficient Water: The water conveyance capacity, storage capacity and flow within the stream has been stabilized.For Inadequate Habitat for Fish and Wildlife: The reduction in the sediment load promotes survival, growth, reproduction, and/or diversity of aquatic organisms within the stream's habitat.

Feature Measure: Linear Feet of Streambank/Shorelin

Scenario Unit: Feet

Scenario Typical Size: 500.00

Scenario Total Cost: $14,864.17

Scenario Cost/Unit: $29.73

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	6	$469.80
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	20	$2,610.20
Seeding Operation, Broadcast, Ground	959	Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs.	Acres	$14.02	0.5	$7.01
Truck, dump, 18 CY	1400	Dump truck for moving bulk material. Typically capacity is 25 ton or 18 cubic yards. Includes equipment only.	Hours	$104.30	7	$730.10
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	33	$1,324.29
Materials						
Mulching, straw or hay	1214	Use of straw or hay for temporary ground cover. Includes application and methods necessary to keep in place such as tacking or crimping. Includes materials, equipment and labor.	Acres	$3,104.31	0.1	$310.43
Rock Riprap, graded, angular, material only	2131	Graded Rock Riprap for 12' to 24' size ranges. Includes material costs only. Delivery or placement not included.	Ton	$22.59	347	$7,838.73
Introduced Perennial Grasses, Legumes and/or Forbs, High Density	2749	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping.	Acres	$88.70	0.5	$44.35
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 580 - Streambank and Shoreline Protection

Scenario: #4 - Riprap on bank 4 ft to 9 ft high measure from bank top to toe of slope

Scenario Description:

Protection of streambanks using structural measures such as riprap, concrete block, gabions, etc. to stabilize and protect banks of streams or excavated channels against scour and erosion. The purpose of this practice is to maintain, improve, or restore physical, chemical, and biological functions of a stream to provide diverse aquatic communities to improve habitat for desired aquatic species. Payment cost include shaping bank and rock rip rap; a 7-foot high bank at 2(H):1(V) slope for 500 linear feet is used for estimation purposes. The rock toe will be 1.5' thick and 5.5' high. The bank above the riprap will be graded to a stable slope, seeded and mulched.Resource Concerns: Soil Erosion - Excessive Bank Erosion from Streams, Shoreline and Water Conveyance Channels; Water Quality Degradation - Excessive Sediment in Surface Waters; Water Quality Degradation - Elevated Water Temperature; Excess/Insufficient Water - Excessive Sediment in Surface Waters; Inadequate Habitat for Fish and Wildlife- Habitat Degradation.Associated Practices include: 560 - Access Road; 382 - Fence; 391 - Riparian Forest Buffer; 390 - Riparian Herbaceous Cover; 395 - Stream Habitat Improvement and Management; 614 - Watering Facility

Before Situation:

A stream bisects the agricultural property and has had all of the woody vegetation removed due to overgrazing or human manipulation; the stream has severely degraded streambanks that are unstable and show signs of active erosion. Soil Erosion: The streambank is unstable.Water Quality Degradation: The sediment load has increased in the stream resulting in elevated water temperatures.Excess/Insufficient Water: The excessive sediment load has reduced the water conveyance capacity, storage capacity and flow within the stream.Inadequate Habitat for Fish and Wildlife: The deficiencies in the stream's habitat limit survival, growth, reproduction, and/or diversity of aquatic organisms within the stream.

After Situation:

The streambank is stable against further erosion and encourages natural sediment transport and deposition. Loss of riparian areas and sediment load is reduced in the stream.For Soil Erosion: The streambank is stable.For Water Quality Degradation: The sediment load has decreased in the stream resulting in improved aquatic habitat.For Excess/Insufficient Water: The water conveyance capacity, storage capacity and flow within the stream has been stabilized.For Inadequate Habitat for Fish and Wildlife: The reduction in the sediment load promotes survival, growth, reproduction, and/or diversity of aquatic organisms within the stream's habitat.

Feature Measure: Linear Feet of Streambank/Shorelin

Scenario Unit: Feet

Scenario Typical Size: 500.00

Scenario Total Cost: $22,063.91

Scenario Cost/Unit: $44.13

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	8	$626.40
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	30	$3,915.30
Seeding Operation, Broadcast, Ground	959	Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs.	Acres	$14.02	0.5	$7.01
Truck, dump, 18 CY	1400	Dump truck for moving bulk material. Typically capacity is 25 ton or 18 cubic yards. Includes equipment only.	Hours	$104.30	11	$1,147.30
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	49	$1,966.37
Materials						
Mulching, straw or hay	1214	Use of straw or hay for temporary ground cover. Includes application and methods necessary to keep in place such as tacking or crimping. Includes materials, equipment and labor.	Acres	$3,104.31	0.21	$651.91
Rock Riprap, graded, angular, material only	2131	Graded Rock Riprap for 12' to 24' size ranges. Includes material costs only. Delivery or placement not included.	Ton	$22.59	539	$12,176.01
Introduced Perennial Grasses, Legumes and/or Forbs, High Density	2749	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping.	Acres	$88.70	0.5	$44.35
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 580 - Streambank and Shoreline Protection

Scenario: #5 - Riprap on bank over 9 ft high measure from bank top to toe of slope

Scenario Description:

Protection of streambanks using structural measures such as riprap, concrete block, gabions, etc. to stabilize and protect banks of streams or excavated channels against scour and erosion. The purpose of this practice is to maintain, improve, or restore physical, chemical, and biological functions of a stream to provide diverse aquatic communities to improve habitat for desired aquatic species. Payment cost include shaping bank and rock rip rap; a 10-foot high bank at 2(H):1(V) slope for 500 linear feet is used for estimation purposes. The rock toe will be 2' thick and 6' high. The bank above the riprap will be graded to a stable slope, seeded and mulched.Resource Concerns: Soil Erosion - Excessive Bank Erosion from Streams, Shoreline and Water Conveyance Channels; Water Quality Degradation - Excessive Sediment in Surface Waters; Water Quality Degradation - Elevated Water Temperature; Excess/Insufficient Water - Excessive Sediment in Surface Waters; Inadequate Habitat for Fish and Wildlife- Habitat Degradation.Associated Practices include: 560 - Access Road; 382 - Fence; 391 - Riparian Forest Buffer; 390 - Riparian Herbaceous Cover; 395 - Stream Habitat Improvement and Management; 614 - Watering Facility

Before Situation:

A stream bisects the agricultural property and has had all of the woody vegetation removed due to overgrazing or human manipulation; the stream has severely degraded streambanks that are unstable and show signs of active erosion. Soil Erosion: The streambank is unstable.Water Quality Degradation: The sediment load has increased in the stream resulting in elevated water temperatures.Excess/Insufficient Water: The excessive sediment load has reduced the water conveyance capacity, storage capacity and flow within the stream.Inadequate Habitat for Fish and Wildlife: The deficiencies in the stream's habitat limit survival, growth, reproduction, and/or diversity of aquatic organisms within the stream.

After Situation:

The streambank is stable against further erosion and encourages natural sediment transport and deposition. Loss of riparian areas and sediment load is reduced in the stream.For Soil Erosion: The streambank is stable.For Water Quality Degradation: The sediment load has decreased in the stream resulting in improved aquatic habitat.For Excess/Insufficient Water: The water conveyance capacity, storage capacity and flow within the stream has been stabilized.For Inadequate Habitat for Fish and Wildlife: The reduction in the sediment load promotes survival, growth, reproduction, and/or diversity of aquatic organisms within the stream's habitat.

Feature Measure: Linear Feet of Streambank/Shorelin

Scenario Unit: Feet

Scenario Typical Size: 500.00

Scenario Total Cost: $28,136.62

Scenario Cost/Unit: $56.27

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	10	$783.00
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	40	$5,220.40
Seeding Operation, Broadcast, Ground	959	Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs.	Acres	$14.02	0.5	$7.01
Truck, dump, 18 CY	1400	Dump truck for moving bulk material. Typically capacity is 25 ton or 18 cubic yards. Includes equipment only.	Hours	$104.30	14	$1,460.20
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	64	$2,568.32
Materials						
Mulching, straw or hay	1214	Use of straw or hay for temporary ground cover. Includes application and methods necessary to keep in place such as tacking or crimping. Includes materials, equipment and labor.	Acres	$3,104.31	0.28	$869.21
Rock Riprap, graded, angular, material only	2131	Graded Rock Riprap for 12' to 24' size ranges. Includes material costs only. Delivery or placement not included.	Ton	$22.59	693	$15,654.87
Introduced Perennial Grasses, Legumes and/or Forbs, High Density	2749	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping.	Acres	$88.70	0.5	$44.35
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 580 - Streambank and Shoreline Protection

Scenario: #6 - Riprap in remote area, long access to site, long haul from quarry

Scenario Description:

Protection of streambanks using structural measures such as riprap, concrete block, gabions, etc. to stabilize and protect banks of streams or excavated channels against scour and erosion. Rock source is greater than 20 miles from job site. The purpose of this practice is to maintain, improve, or restore physical, chemical, and biological functions of a stream to provide diverse aquatic communities to improve habitat for desired aquatic species. Payment cost include shaping bank, geotextile, and rock rip rap; a 6-foot high bank at 3(H):1(V) slope for 300 linear feet is used for estimation purposes. The rock toe will be 2' thick and 5' high. The bank above the riprap will be graded to a stable slope and revegetated.Resource Concerns: Soil Erosion - Excessive Bank Erosion from Streams, Shoreline and Water Conveyance Channels; Water Quality Degradation - Excessive Sediment in Surface Waters; Water Quality Degradation - Elevated Water Temperature; Excess/Insufficient Water - Excessive Sediment in Surface Waters; Inadequate Habitat for Fish and Wildlife- Habitat Degradation.Associated Practices include: 560 - Access Road; 382 - Fence; 391 - Riparian Forest Buffer; 390 - Riparian Herbaceous Cover; 395 - Stream Habitat Improvement and Management; 614 - Watering Facility

Before Situation:

A stream bisects the agricultural property and has had all of the woody vegetation removed due to overgrazing or human manipulation; the stream has severely degraded streambanks that are unstable and show signs of active erosion. Soil Erosion: The streambank is unstable.Water Quality Degradation: The sediment load has increased in the stream resulting in elevated water temperatures.Excess/Insufficient Water: The excessive sediment load has reduced the water conveyance capacity, storage capacity and flow within the stream.Inadequate Habitat for Fish and Wildlife: The deficiencies in the stream's habitat limit survival, growth, reproduction, and/or diversity of aquatic organisms within the stream.

After Situation:

The streambank is stable against further erosion and encourages natural sediment transport and deposition. Loss of riparian areas and sediment load is reduced in the stream.For Soil Erosion: The streambank is stable.For Water Quality Degradation: The sediment load has decreased in the stream resulting in improved aquatic habitat.For Excess/Insufficient Water: The water conveyance capacity, storage capacity and flow within the stream has been stabilized.For Inadequate Habitat for Fish and Wildlife: The reduction in the sediment load promotes survival, growth, reproduction, and/or diversity of aquatic organisms within the stream's habitat.The typical scenario unit is SY of Rock Riprap measured by Linear feet of streambank/shoreline protected multiplied by the height of bank to be protected measured along the protected bank slope. The protected bank height of 5ft. on a 3H:1V slope and 300ft. in length, the typical quantity is 300ft. x 15.8ft. = 4740SF = 526.7 SY. (Use 527 Sy. Yds.)

Feature Measure: Square Yards of Streambank/Shorel

Scenario Unit: Square Yard

Scenario Typical Size: 527.00

Scenario Total Cost: $83,187.26

Scenario Cost/Unit: $157.85

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	10	$783.00
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	20	$2,610.20
Seeding Operation, Broadcast, Ground	959	Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs.	Acres	$14.02	0.3	$4.21
Front End Loader, 130 HP	1618	Wheeled front end loader with horsepower range of 110 to 140. Equipment and power unit costs. Labor not included.	Hours	$62.95	30	$1,888.50
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	20	$574.20
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	60	$2,407.80
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	19	$923.40
Materials						
Silt Fence	43	Silt fence with support post. Includes materials, equipment and labor	Feet	$3.00	300	$900.00
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement.	Cubic Yards	$136.88	450	$61,596.00
Mulching, straw or hay	1214	Use of straw or hay for temporary ground cover. Includes application and methods necessary to keep in place such as tacking or crimping. Includes materials, equipment and labor.	Acres	$3,104.31	0.3	$931.29

Floating Turbidity Curtain, Permeable, 4 ft.	2351	Floating permeable vinyl curtain with chain or cable weight and all necessary anchoring required for installation in flowing streams or rivers. Does not include labor for installation or removal. Includes materials and shipping only.	Feet	$15.08	100	$1,508.00
Introduced Perennial Grasses, Legumes and/or Forbs, High Density	2749	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping.	Acres	$88.70	0.3	$26.61
Coir Erosion Control Fabric	2765	Open weave spun coir erosion control fabric. Includes materials and shipping only.	Square Yard	$2.78	220	$611.60
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	300	$300.00
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19
Aggregate, Shipping, Cubic Yard-mile	2360	Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul).	Cubic Yard Mile	$0.42	13500	$5,670.00

Practice: 580 - Streambank and Shoreline Protection

Scenario: #8 - Rock Riprap MN-TR3

Scenario Description:

Protection of streambanks using structural measures such as riprap following Minnesota TR-3, 'Loose Riprap Protection' to stabilize and protect banks of streams or excavated channels against scour and erosion. The purpose of this practice is to maintain, improve, or restore physical, chemical, and biological functions of a stream to provide diverse aquatic communities to improve habitat for desired aquatic species. Payment cost include shaping bank and rock rip rap; a 7-foot high bank at 2.5(H):1(V) slope for 500 linear feet is used for estimation purposes. Rock D50 = 12' with a rock thickness of 30'. The rock toe will be per Method B of MN TR-3, Figure 2-6. This results in a rock riprap surface length measured perpendicular to the channel of ~35 ft. and 17,500 ft2 total.The bank above the riprap will be graded to a stable slope.Resource Concerns: Soil Erosion - Excessive Bank Erosion from Streams, Shoreline and Water Conveyance Channels; Water Quality Degradation - Excessive Sediment in Surface Waters; Water Quality Degradation - Elevated Water Temperature; Excess/Insufficient Water - Excessive Sediment in Surface Waters; Inadequate Habitat for Fish and Wildlife- Habitat Degradation.Associated Practices include: 560 - Access Road; 342 - Critical Area Planting; 382 - Fence; 391 - Riparian Forest Buffer; 390 - Riparian Herbaceous Cover; 395 - Stream Habitat Improvement and Management; 614 - Watering Facility

Before Situation:

A stream bisects the agricultural property and has had all of the woody vegetation removed due to overgrazing or human manipulation; the stream has severely degraded streambanks that are unstable and show signs of active erosion. Soil Erosion: The streambank is unstable.Water Quality Degradation: The sediment load has increased in the stream resulting in elevated water temperatures.Excess/Insufficient Water: The excessive sediment load has reduced the water conveyance capacity, storage capacity and flow within the stream.Inadequate Habitat for Fish and Wildlife: The deficiencies in the stream's habitat limit survival, growth, reproduction, and/or diversity of aquatic organisms within the stream.

After Situation:

The streambank is stable against further erosion and encourages natural sediment transport and deposition. Loss of riparian areas and sediment load is reduced in the stream.For Soil Erosion: The streambank is stable.For Water Quality Degradation: The sediment load has decreased in the stream resulting in improved aquatic habitat.For Excess/Insufficient Water: The water conveyance capacity, storage capacity and flow within the stream has been stabilized.For Inadequate Habitat for Fish and Wildlife: The reduction in the sediment load promotes survival, growth, reproduction, and/or diversity of aquatic organisms within the stream's habitat.

Feature Measure: Square Foot of riprap protection

Scenario Unit: Square Feet

Scenario Typical Size: 17,500.00

Scenario Total Cost: $223,427.96

Scenario Cost/Unit: $12.77

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	10	$783.00
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	10	$1,305.10
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	20	$802.60
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement.	Cubic Yards	$136.88	1600	$219,008.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 580 - Streambank and Shoreline Protection

Scenario: #9 - Structural Toewood w/Vegetation

Scenario Description:

Protection of streambanks using toewood (large wood members with root wads) as a structural measure in conjunction with bioengineering techniques involving vegetative measures to stabilize and protect the streambank against scour and erosion. Environmental benefits derived from woody vegetation include diverse and productive riparian habitats, shade, organic additions to the stream, cover for fish, and improvements in aesthetic value and water quality. The purpose of this practice is to maintain, improve, or restore physical, chemical, and biological functions of a stream to provide diverse aquatic communities to improve habitat for desired aquatic species. Payment cost include protection by use of large wood members with root wads, willow cuttings and revetments, bankfull bench construction, bank shaping, riparian-corridor revegetation, geotextile, and rock riprap to establish grade/fill void spaces.Resource Concerns: Soil Erosion - Excessive Bank Erosion from Streams, Shoreline and Water Conveyance Channels; Water Quality Degradation - Excessive Sediment in Surface Waters; Water Quality Degradation - Elevated Water Temperature; Excess/Insufficient Water - Excessive Sediment in Surface Waters; Inadequate Habitat for Fish and Wildlife- Habitat Degradation.Associated Practices include: 560 - Access Road; 342 - Critical Area Planting; 382 - Fence; 391 - Riparian Forest Buffer; 390 - Riparian Herbaceous Cover; 395 - Stream Habitat Improvement and Management; 614 - Watering Facility

Before Situation:

A stream bisects the agricultural property and has had all of the woody vegetation removed due to overgrazing or human manipulation; the stream has moderately degraded streambanks that are unstable and show signs of active erosion. Soil Erosion: The streambank is unstable.Water Quality Degradation: The sediment load has increased in the stream resulting in elevated water temperatures.Excess/Insufficient Water: The excessive sediment load has reduced the water conveyance capacity, storage capacity and flow within the stream.Inadequate Habitat for Fish and Wildlife: The deficiencies in the stream's habitat limit survival, growth, reproduction, and/or diversity of aquatic organisms within the stream.

After Situation:

The streambank is stable against further erosion and encourages natural sediment transport and deposition. Loss of riparian areas and sediment load is reduced in the stream.For Soil Erosion: The streambank is stable.For Water Quality Degradation: The sediment load has decreased in the stream resulting in improved aquatic habitat.For Excess/Insufficient Water: The water conveyance capacity, storage capacity and flow within the stream has been stabilized.For Inadequate Habitat for Fish and Wildlife: The reduction in the sediment load promotes survival, growth, reproduction, and/or diversity of aquatic organisms within the stream's habitat.

Feature Measure: Linear Feet of Streambank/Shorelin

Scenario Unit: Feet

Scenario Typical Size: 1,000.00

Scenario Total Cost: $109,816.80

Scenario Cost/Unit: $109.82

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	2500	$10,025.00
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	16	$1,252.80
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hours	$145.01	168.8	$24,477.69
Seeding Operation, Broadcast, Ground	959	Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs.	Acres	$14.02	0.12	$1.68
Excavation, common earth, wet, side cast, large equipment	1228	Bulk excavation and side casting of wet common earth with hydraulic excavator or dragline with greater than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$4.72	2500	$11,800.00
Front End Loader, 185 HP	1619	Wheeled front end loader with horsepower range of 160 to 210. Equipment and power unit costs. Labor not included.	Hours	$104.50	36	$3,762.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	117.5	$3,373.43
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	16	$485.76
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	204.75	$8,216.62
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	112	$5,443.20
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement.	Cubic Yards	$136.88	138.9	$19,012.63

Erosion Control Blanket, biodegradable	1213	Biodegradable erosion control blanket, typically a composite of natural fibers with reinforcing polymer netting. Materials and shipping only.	Square Yard	$1.65	2222	$3,666.30
Tree, Hardwood, Seedling, Medium	1510	Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only.	Each	$1.74	1000	$1,740.00
Shrub, Potted, Medium	1527	Potted shrub seedling, 2 gallons or larger. Includes materials and shipping only.	Each	$14.34	200	$2,868.00
Root Wad	2045	Tree stump buried into the streambank with the roots left exposed. Includes material only.	Ton	$7.93	1220	$9,674.60
Annual Grasses	2730	Annual grasses, one or more species, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$40.79	0.5	$20.40
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	4	$3,692.76

Practice: 580 - Streambank and Shoreline Protection

Scenario: #31 - Structural

Scenario Description:

Protection of streambanks using structural measures such as riprap, concrete block, gabions, etc. to stabilize and protect banks of streams or excavated channels against scour and erosion. Additional structural measures may also include tree revetments; log, rootwad and boulder revetments; dormant post plantings; piling revetments with wire or geotextile fencing; piling revetments with slotted fencing; jacks or jack fields; rock riprap; stream jetties; stream barbs; and gabions. The purpose of this practice is to maintain, improve, or restore physical, chemical, and biological functions of a stream to provide diverse aquatic communities to improve habitat for desired aquatic species. Payment cost include shaping bank, critical area vegetation, geotextile, and rock rip rap; a 6-foot high bank at 3(H):1(V) slope for 1000 linear feet (0.46 acres) is used for estimation purposes. The rock toe will be 3' thick and 5' high. The bank above the riprap will be graded to a stable slope and revegetated.Resource Concerns: Soil Erosion - Excessive Bank Erosion from Streams, Shoreline and Water Conveyance Channels; Water Quality Degradation - Excessive Sediment in Surface Waters; Water Quality Degradation - Elevated Water Temperature; Excess/Insufficient Water - Excessive Sediment in Surface Waters; Inadequate Habitat for Fish and Wildlife- Habitat Degradation.Associated Practices include: 560 - Access Road; 342 - Critical Area Planting; 382 - Fence; 391 - Riparian Forest Buffer; 390 - Riparian Herbaceous Cover; 395 - Stream Habitat Improvement and Management; 614 - Watering Facility

Before Situation:

A stream bisects the agricultural property and has had all of the woody vegetation removed due to overgrazing or human manipulation; the stream has severely degraded streambanks that are unstable and show signs of active erosion. Soil Erosion: The streambank is unstable.Water Quality Degradation: The sediment load has increased in the stream resulting in elevated water temperatures.Excess/Insufficient Water: The excessive sediment load has reduced the water conveyance capacity, storage capacity and flow within the stream.Inadequate Habitat for Fish and Wildlife: The deficiencies in the stream's habitat limit survival, growth, reproduction, and/or diversity of aquatic organisms within the stream.

After Situation:

The streambank is stable against further erosion and encourages natural sediment transport and deposition. Loss of riparian areas and sediment load is reduced in the stream.For Soil Erosion: The streambank is stable.For Water Quality Degradation: The sediment load has decreased in the stream resulting in improved aquatic habitat.For Excess/Insufficient Water: The water conveyance capacity, storage capacity and flow within the stream has been stabilized.For Inadequate Habitat for Fish and Wildlife: The reduction in the sediment load promotes survival, growth, reproduction, and/or diversity of aquatic organisms within the stream's habitat.

Feature Measure: Linear Feet of Streambank/Shorelin

Scenario Unit: Feet

Scenario Typical Size: 1,000.00

Scenario Total Cost: $270,382.71

Scenario Cost/Unit: $270.38

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	2500	$10,025.00
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	16	$1,252.80
Seeding Operation, Broadcast, Ground	959	Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs.	Acres	$14.02	0.12	$1.68
Excavation, common earth, wet, side cast, large equipment	1228	Bulk excavation and side casting of wet common earth with hydraulic excavator or dragline with greater than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$4.72	2500	$11,800.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	360	$10,335.60
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	16	$485.76
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	90	$4,374.00
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement.	Cubic Yards	$136.88	1667	$228,178.96
Erosion Control Blanket, biodegradable	1213	Biodegradable erosion control blanket, typically a composite of natural fibers with reinforcing polymer netting. Materials and shipping only.	Square Yard	$1.65	556	$917.40
Annual Grasses	2730	Annual grasses, one or more species, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$40.79	25	$1,019.75
Mobilization						

Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 580 - Streambank and Shoreline Protection

Scenario: #32 - Riprap on Bank =< 20 miles

Scenario Description:

Protection of streambanks using structural measures such as riprap, concrete block, gabions, etc. to stabilize and protect banks of streams or excavated channels against scour and erosion. Rock source is within 20 miles from job site. The purpose of this practice is to maintain, improve, or restore physical, chemical, and biological functions of a stream to provide diverse aquatic communities to improve habitat for desired aquatic species. Payment cost include shaping bank, geotextile, and rock rip rap; a 6-foot-high bank at 3(H):1(V) slope for 300 linear feet is used for estimation purposes. The rock toe will be 2' thick and 5' high. The bank above the riprap will be graded to a stable slope and revegetated. Resource Concerns: Soil Erosion - Excessive Bank Erosion from Streams, Shoreline and Water Conveyance Channels; Water Quality Degradation - Excessive Sediment in Surface Waters; Water Quality Degradation - Elevated Water Temperature; Excess/Insufficient Water - Excessive Sediment in Surface Waters; Inadequate Habitat for Fish and Wildlife- Habitat Degradation. Associated Practices include: 560 - Access Road; 382 - Fence; 391 - Riparian Forest Buffer; 390 - Riparian Herbaceous Cover; 395 - Stream Habitat Improvement and Management; 614 - Watering Facility

Before Situation:

A stream bisects the agricultural property and has had all of the woody vegetation removed due to overgrazing or human manipulation; the stream has severely degraded streambanks that are unstable and show signs of active erosion. Soil Erosion: The streambank is unstable. Water Quality Degradation: The sediment load has increased in the stream resulting in elevated water temperatures. Excess/Insufficient Water: The excessive sediment load has reduced the water conveyance capacity, storage capacity and flow within the stream. Inadequate Habitat for Fish and Wildlife: The deficiencies in the stream's habitat limit survival, growth, reproduction, and/or diversity of aquatic organisms within the stream.

After Situation:

The streambank is stable against further erosion and encourages natural sediment transport and deposition. Loss of riparian areas and sediment load is reduced in the stream. For Soil Erosion: The streambank is stable. For Water Quality Degradation: The sediment load has decreased in the stream resulting in improved aquatic habitat. For Excess/Insufficient Water: The water conveyance capacity, storage capacity and flow within the stream has been stabilized. For Inadequate Habitat for Fish and Wildlife: The reduction in the sediment load promotes survival, growth, reproduction, and/or diversity of aquatic organisms within the stream's habitat. The typical scenario unit is SY of Rock Riprap measured by Linear feet of streambank/shoreline protected multiplied by the height of bank to be protected measured along the protected bank slope. The protected bank height of 5ft. on a 3H:1V slope and 300ft. in length, the typical quantity is 300ft. x 15.8ft. = 4740SF = 526.7 SY. (Use 527 Sq..Yds.)

Feature Measure: Square Yards of Streambank/Shorel

Scenario Unit: Square Yard

Scenario Typical Size: 527.00

Scenario Total Cost: $77,217.26

Scenario Cost/Unit: $146.52

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	10	$783.00
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	20	$2,610.20
Seeding Operation, Broadcast, Ground	959	Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs.	Acres	$14.02	0.3	$4.21
Front End Loader, 130 HP	1618	Wheeled front end loader with horsepower range of 110 to 140. Equipment and power unit costs. Labor not included.	Hours	$62.95	30	$1,888.50
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	20	$574.20
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	60	$2,407.80
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	19	$923.40
Materials						
Silt Fence	43	Silt fence with support post. Includes materials, equipment and labor	Feet	$3.00	300	$900.00
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement.	Cubic Yards	$136.88	450	$61,596.00
Mulching, straw or hay	1214	Use of straw or hay for temporary ground cover. Includes application and methods necessary to keep in place such as tacking or crimping. Includes materials, equipment and labor.	Acres	$3,104.31	0.3	$931.29

Floating Turbidity Curtain, Permeable, 4 ft.	2351	Floating permeable vinyl curtain with chain or cable weight and all necessary anchoring required for installation in flowing streams or rivers. Does not include labor for installation or removal. Includes materials and shipping only.	Feet	$15.08	100	$1,508.00
Introduced Perennial Grasses, Legumes and/or Forbs, High Density	2749	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping.	Acres	$88.70	0.3	$26.61
Coir Erosion Control Fabric	2765	Open weave spun coir erosion control fabric. Includes materials and shipping only.	Square Yard	$2.78	220	$611.60
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 582 - Open Channel

Scenario: #1 - Two stage ditch

Scenario Description:

This scenario is the improvement of a channel in which water flows with a free surface. The practice is used for the restoration of a natural or artificial channel to improve nutrient (phosphorus and nitrate) reduction and ecological function by creating a floodplain bench. Installation conditions are normal which means the location is easily accessible from a main road, soils are without large rock or difficult clay to excavate, and/or other aspects are average compared to excavation work in the area.

Before Situation:

A stream or channel with active streambank erosion and excess nutrient load from upstream or tile entry sources. This scenario assists in addressing the resource concerns: water quality, streambank erosion, sediment deposition.

After Situation:

An earthen floobplain bench is excavated above low channel flow to create floodplain flow area and to stabilize the bottom and side slopes. Nutrients are reduced in the water through bench saturation. Erosion is no longer a resource concern. Typical construction dimensions are similar to Fig. 10-9 in Stream Restoration Design handbook with 10 ft wide benchs excavated on either side of 6 ft deep ditch. Total excavation = 5' x 10' X 2 sides = 100 cubic feet per foot. Cool season grasses are established on the bench and slope areas using 342 Critical Area Planting. Need for mulching (straw or erosion control blanket) would be accomplished through 484-Mulching as necessary. Associated practices: 356-Dike, 393-Filter Strip, 484-Mulching 587-Structure For Water Control, 533-Pumping Plant, 580 Streambank and Shoreline Protection, 584 Channel Stabilization, 578 Stream Crossing.

Feature Measure: length of channel

Scenario Unit: Feet

Scenario Typical Size: 1,000.00

Scenario Total Cost: $12,732.46

Scenario Cost/Unit: $12.73

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	3700	$9,324.00
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	24	$1,879.20
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 582 - Open Channel

Scenario: #15 - Excavation, Off-Site Spoil Disposal

Scenario Description:
This scenario is the construction or improvement of a channel in which water flows with a free surface. Typical construction dimensions are floodplain excavation of 8' deep x 10' wide bench x 500' length with a side slope of 2.5:1. (3 cubic yards/linear foot) The practice is used for the restoration of a natural or artificial channel to improve the process and ecological function in a degraded and eroding stream. Conditions are normal. Spoil from excavation cannot be spread adjacent to the excavation area because of wetland or floodplain restrictions. Spoil must be hauled off site for disposal. This scenario assists in addressing the resource concerns: streambank erosion, sediment deposition, excessive flooding or ponding. Conservation practices that may be associated are: 580 Streambank and Shoreline Protection, 584 Channel Stabilization, 578 Stream Crossing, 342 Critical Area Planting, 484 Mulching

Before Situation:
A stream or channel with active streambank erosion or headcuts and inadequate capacity to handle the flow needed for flood prevention, drainage or erosion prevention.

After Situation:
An earthen channel was excavated to allow unrestricted flow of water and to stabilize the bottom and side slopes. Flooding and erosion is no longer a resource concern.

Feature Measure: Excavation Volume

Scenario Unit: Cubic Yards

Scenario Typical Size: 1,500.00

Scenario Total Cost: $11,166.70

Scenario Cost/Unit: $7.44

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	16	$1,252.80
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hours	$145.01	16	$2,320.16
Truck, dump, 18 CY	1400	Dump truck for moving bulk material. Typically capacity is 25 ton or 18 cubic yards. Includes equipment only.	Hours	$104.30	32	$3,337.60
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	64	$2,568.32
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 582 - Open Channel

Scenario: #16 - Excavation, On-Site Spoil Disposal

Scenario Description:
This scenario is the construction or improvement of a channel in which water flows with a free surface. Typical construction dimensions are floodplain excavation of 8' deep x 10' wide bench x 500' length with a side slope of 2.5:1. (3 cubic yards/linear foot) The practice is used for the restoration of a natural or artificial channel to improve the process and ecological function in a degraded and eroding stream. Conditions are normal. Normal conditions include: a location easily accessible from a main road, soils without large rock or difficult clay to excavate, and/or other aspects that are average compared to excavation work in the area. Spoil from excavation is able to be spread adjacent to the excavation area without trucking. This scenario assists in addressing the resource concerns: streambank erosion, sediment deposition, excessive flooding or ponding. Conservation practices that may be associated are: 580 Streambank and Shoreline Protection, 584 Channel Stabilization, 578 Stream Crossing, 342 Critical Area Planting, 484 Mulching

Before Situation:
A stream or channel with active streambank erosion or headcuts and inadequate capacity to handle the flow needed for flood prevention, drainage or erosion prevention.

After Situation:
An earthen channel was excavated to allow unrestricted flow of water and to stabilize the bottom and side slopes. Flooding and erosion is no longer a resource concern.

Feature Measure: Excavated Volume

Scenario Unit: Cubic Yards

Scenario Typical Size: 1,500.00

Scenario Total Cost: $6,544.94

Scenario Cost/Unit: $4.36

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	16	$1,252.80
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hours	$145.01	16	$2,320.16
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	32	$1,284.16
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 584 - Channel Bed Stabilization

Scenario: #1 - Rock structures

Scenario Description:

Stabilize the bottom and slope of a stream channel using engineered rock structures. rock riprap or engineered products that consist primarily of rock or concrete. This includes but is not limited to gabions, rock veins, rock weirs, J hook vanes, cross vanes, concrete blocks,etc. Typical stream has 20 foot bottom width and 3 foot banks. Length of area 100 feet. Based on degrading channel that needs to be riprapped its entire wetted perimeter.

Before Situation:

Bed of an existing or newly constructed alluvial or threshold channel is undergoing damaging aggradation or degradation. Changes cannot be controlled feasibly with clearing and snagging, vegetation, bank protection or upstream water control.Soil Erosion: The stream is unstable.Water Quality Degradation: The sediment load has increased in the stream resulting in elevated water temperatures.Excess/Insufficient Water: The excessive sediment load has reduced the water conveyance capacity, storage capacity and flow within the stream.Inadequate Habitat for Fish and Wildlife: The deficiencies in the stream's habitat limit survival, growth, reproduction, and/or diversity of aquatic organisms within the stream.

After Situation:

Stream channel is stable. Re-vegetation of exposed surfaces will be completed using 342 - Critical Area Planting. Use Spoil Spreading (572) where needed. Other associated practices could be (326) Clearing and Snagging, (396) Aquatic Organism Passage, (395) Stream Habitat Improvement and Management, (580) Streambank and Shoreline Protection, or (587) Structure for Water Control.For Soil Erosion: The streambank is stable.For Water Quality Degradation: The sediment load has decreased in the stream resulting in improved aquatic habitat.For Excess/Insufficient Water: The water conveyance capacity, storage capacity and flow within the stream has been stabilized.For Inadequate Habitat for Fish and Wildlife: The reduction in the sediment load promotes survival, growth, reproduction, and/or diversity of aquatic organisms within the stream's habitat. Typical stream has 20 foot bottom width and 3 foot banks and 2.5:1 side slopes. Length of area 100 feet. Based on placement of two rock cross vanes that span the channel.

Feature Measure: Square feet of constructed channel

Scenario Unit: Square Feet

Scenario Typical Size: 3,500.00

Scenario Total Cost: $13,682.64

Scenario Cost/Unit: $3.91

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	5	$330.90
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hours	$145.01	20	$2,900.20
Water management, Flooding & dewatering	969	Includes equipment and power unit. Labor not included.	Acre Feet	$295.73	23	$6,801.79
Truck, dump, 8 CY	1401	Dump truck for moving bulk material. Typically capacity is 12 ton or 8 cubic yards. Includes equipment only.	Hours	$55.22	6	$331.32
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	32	$918.72
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	20	$802.60
Materials						
Rock Riprap, graded, angular, material and shipping	1200	Graded Rock Riprap for all gradation ranges. Includes materials and local delivery within 20 miles of quarry. Placement costs are not included.	Ton	$37.44	18	$673.92
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 584 - Channel Bed Stabilization

Scenario: #25 - Rock Weir

Scenario Description:
Stabilize the bottom and slope of a stream channel using rock riprap or engineered products that consist primarily of rock. This includes but not limited to gabions, rock veins, rock weirs, etc. Typical stream has 20 foot bottom width and 3 foot banks.

Before Situation:
Bed of an existing or newly constructed alluvial or threshold channel is undergoing damaging aggradation or degradation. Changes cannot be controlled feasibly with clearing and snagging, vegetation, bank protection or upstream water control. Soil Erosion: The stream is unstable. Water Quality Degradation: The sediment load has increased in the stream resulting in elevated water temperatures. Excess/Insufficient Water: The excessive sediment load has reduced the water conveyance capacity, storage capacity and flow within the stream. Inadequate Habitat for Fish and Wildlife: The deficiencies in the stream's habitat limit survival, growth, reproduction, and/or diversity of aquatic organisms within the stream.

After Situation:
Stream channel is stable. Re-vegetation of exposed surfaces will be completed using 342 - Critical Area Planting. Use Spoil Spreading (572) where needed. Other associated practices could be (326) Clearing and Snagging, (396) Aquatic Organism Passage, (395) Stream Habitat Improvement and Management, (580) Streambank and Shoreline Protection, or (587) Structure for Water Control. For Soil Erosion: The streambank is stable. For Water Quality Degradation: The sediment load has decreased in the stream resulting in improved aquatic habitat. For Excess/Insufficient Water: The water conveyance capacity, storage capacity and flow within the stream has been stabilized. For Inadequate Habitat for Fish and Wildlife: The reduction in the sediment load promotes survival, growth, reproduction, and/or diversity of aquatic organisms within the stream's habitat. Typical stream has 20 foot bottom width and 3 foot banks and 2.5:1 side slopes. Based on placement of four rock cross vanes that span the channel.

Feature Measure: Number of Structures

Scenario Unit: Each

Scenario Typical Size: 4.00

Scenario Total Cost: $5,436.95

Scenario Cost/Unit: $1,359.24

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hours	$145.01	8	$1,160.08
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	8	$321.04
Materials						
Rock Riprap, graded, angular, material and shipping	1200	Graded Rock Riprap for all gradation ranges. Includes materials and local delivery within 20 miles of quarry. Placement costs are not included.	Ton	$37.44	81	$3,032.64
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 585 - Stripcropping

Scenario: #1 - Stripcropping - wind and water erosion

Scenario Description:

This scenario describes the implementation of a strip cropping system that is designed specifically for the control of wind and water erosion or minimizing the transport of sediments or other water borne contaminants originating from runoff on cropland. The planned strip cropping system will meet the current 585 standard. Implementation will result in alternating strips of erosion susceptible crops with erosion resistant crops that are oriented as close to perpendicular to water flows as possible. The designed system will reduce erosion/sediment/contaminants to desired objectives. The scenario includes the costs of designing the system, installing the strips on the landscape appropriately, and integrating a crop rotation that includes water erosion resistant species.

Before Situation:

In this geographic area, excessive water erosion is caused by raising crops in a manner that allows sheet water flows to travel down the slope causing sheet and rill erosion or concentrated flow conditions, degradation of soil health through loss of topsoil and organic matter, along with offsite negative impacts to water quality and aquatic wildlife habitat.

After Situation:

A strip cropping system that includes at least two or more strips within the planning slope will be designed to include parallel strips of approximately equal widths of water erosion resistant crop species with non-water erosion resistant crop species. Widths will be determined using current water erosion prediction technology to meet objectives. The design and implementation of a stripcropping system will minimize wind, sheet and rill erosion, protect soil quality, reduce offsite sedimentation, and benefit offsite aquatic wildlife habitat. Erosion prediction before and after practice application will be recorded showing the design and benefits of the practice. Erosion resistant strips in rotation must be managed to maintain the planned vegetative cover and surface roughness.

Feature Measure: area of strips

Scenario Unit: Acres

Scenario Typical Size: 80.00

Scenario Total Cost: $162.21

Scenario Cost/Unit: $2.03

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	3	$76.08
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	3	$86.13

Practice: 587 - Structure for Water Control

Scenario: #2 - Inline or Inlet Flashboard Riser, Metal

Scenario Description:

A Flashboard Riser fabricated of metal and used in a water management system that maintains a desired water surface elevation, controls the direction or rate of flow, or conveys water to address the resource concerns: Inadequate Water - Inefficient use of Irrigation Water and Inadequate habitat for Fish and Wildlife. The water surface elevation is controlled by addition or removal of slats or 'stoplogs'. This scenario is applicable to variable crest weir structures where the elevation is controlled at the embankment. They are often fabricated from vertical pipes with the stoplogs are located in the middle (i.e. Full-Rounds) or sheet steel in a box shape. Payment rate is based upon the Flashboard Weir Length in inches multiplied by the outlet length in feet (Inch-Foot). Cost estimate is based on a 'Half-Round' flashboard riser shop fabricated using a longitudinal cut 36' smooth steel pipe, a 50' long - 30' outlet pipe passing through an embankment.

Before Situation:

The operator presently flood irrigates his field for wild rice or cranberries and has no means to accurately maintain a constant water level at varying elevations resulting in a lack of flexibility, and inefficient use of water and energy during pumping. The operator may instead desire to maintain a permanent pool for water fowl during the winter.

After Situation:

The operator has the capability to more efficiently control and maintain a range of water surface elevations thereby reducing the flow rate needed. Less water is wasted and both water and energy is conserved. The operator is now able to maintain adequate water during the winter as a benefit to waterfowl. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Irrigation Water Management (449), Irrigation Land Leveling (464), Irrigation Canal or Lateral (320), Irrigation System, Tailwater Recovery (447), Dike (356), and Grade Stabilization Structure (410) will use the corresponding Standard(s) as appropriate.

Feature Measure: Flashboard Weir Length (in) x Barre

Scenario Unit: Diameter Inch Foot

Scenario Typical Size: 1,800.00

Scenario Total Cost: $9,818.63

Scenario Cost/Unit: $5.45

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	190	$761.90
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	15	$93.75
Hydraulic Excavator, .5 CY	930	Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included.	Hours	$101.18	4	$404.72
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	7	$307.09
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	10	$287.10
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	4	$160.52
Materials						
Steel, Angle, 2 1/2 in. x 2 1/2 in. x 1/4 in.	1372	Materials: Angle, 2 1/2 inch x 2 1/2 inch x 1/4 inch. Meets ASTM A36	Feet	$4.19	24	$100.56
Steel, Plate, 3/8 in.	1375	Flat steel plate, 3/8 inch thickness. Materials only.	Square Feet	$22.51	10	$225.10
Lumber, planks, posts and timbers, treated	1609	Treated dimension lumber with nominal thickness greater than 2 inches. Includes lumber and fasteners. Does not include labor.	Board Feet	$3.53	4	$14.12
Pipe, Steel, Std Wt., Used, weight priced	2870	Schedule 40 steel pipe, used. Materials only.	Pound	$0.96	6788.6	$6,517.06
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 587 - Structure for Water Control

Scenario: #3 - Inline Flashboard Riser, Commercial

Scenario Description:

An Inline Water Control Structure (WCS) composed of plastic that maintains a desired water surface elevation, controls the direction or rate of flow, or conveys water to address the resource concern: Inadequate habitat for Fish and Wildlife. The water surface elevation is controlled by addition or removal of slats or 'stoplogs'. This scenario is applicable to variable crest weir structures where the elevation is controlled at point along a pipe extending through an embankment, providing ease of access to the structure and provide better protection against beaver activity. Commercially available models composed of plastic are commonly used when the width of the structure is 24' or less. Payment rate is based upon the Flashboard Weir Length in inches multiplied by the outlet length in feet (Inch-Foot). Cost estimate is based on a using a such a commercial product. The typical scenario is an inline structure with a width of 20', height of six feet, The pipe is 50' of 18' SCH 40 PVC (inlet and outlet combined).

Before Situation:

The landowner wishes to provide for a way to control the water surface elevation in a wetland area. The landowner wishes to enhance and enlarge the area to provide habitat for fish and wildlife.

After Situation:

A WCS is installed in a flow line allowing shallow water impoundments. A wetland area is enhanced and water levels can be varied to better accommodate wildlife needs. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Wetland Creation (658), Wetland Enhancement (659) Wetland Wildlife Habitat Management (644), Dike (356), and Grade Stabilization Structure (410) will use the corresponding Standard(s) as appropriate.

Feature Measure: Flashboard Weir Length (in) x Barre

Scenario Unit: Diameter Inch Foot

Scenario Typical Size: 1,000.00

Scenario Total Cost: $7,211.80

Scenario Cost/Unit: $7.21

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	190	$761.90
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	15	$93.75
Hydraulic Excavator, .5 CY	930	Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included.	Hours	$101.18	2	$202.36
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	3	$131.61
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	2	$80.26
Materials						
Pipe, PVC, dia. => 18 in., weight priced	1958	Polyvinyl Chloride (PVC) Pipe priced by the weight of the pipe materials for pipes with diameters equal to or greater than 18 inch. Materials only.	Pound	$2.41	988	$2,381.08
Water Control Structure, Stoplog, Inline, fixed costs portion	2145	Fixed cost portion of Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Materials only.	Each	$367.01	1	$367.01
Water Control Structure, Stoplog, Inline, variable cost portion	2146	Variable cost portion of a Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Calculate total variable costs by multiplying by the structure height x pipe diameter. Materials only.	Height x Diameter	$18.68	108	$2,017.44
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 587 - Structure for Water Control

Scenario: #6 - Flap gate structure

Scenario Description:
This scenario is the installation of a permanent flap gate structure to control the direction of flow resulting from high water or back-flow from flooding. The typical size is a 2' diameter opening. It is made of steel and operates automatically. The flap gate is installed on a conduit. This scenario assists in addressing the resource concerns: water management. Conservation practices that may be associated are: Critical Area Planting (342), Grade Stabilization Structure (410), Water and Sediment Control Basin (638).

Before Situation:
A wetland or other area is in need of a flap gate to control the direction of the water.

After Situation:
A flap gate 2' diameter is installed.

Feature Measure: Feet Diameter (of Gate)

Scenario Unit: Feet

Scenario Typical Size: 2.00

Scenario Total Cost: $1,623.79

Scenario Cost/Unit: $811.90

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	2	$132.36
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	2	$87.74
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	2	$80.26
Materials						
Flap Gate, 24 inch	2099	24 inch diameter cast flap gate. Materials only.	Each	$558.80	1	$558.80
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 587 - Structure for Water Control

Scenario: #12 - Outlet Structure and External Harvest Kettle for an Existing Aquaculture Pond

Scenario Description:

An existing Aquaculture pond which requires an Outlet Structure and Harvest Kettle to manage water levels and drain water from the pond and allow fish to move from the pond to a Harvest Kettle area where the fish are removed from the water. Typical Outlet Structure is a tapered reinforced concrete outlet structure with a 7.5ft back wall and side walls tapering down to the pond floor. The structure is made up of reinforced concrete walls (1ft thick) and floor with a footprint of approximately 290 SF and Concrete stairs along 1 side for a total of 17CY of concrete. There is guardrail around the perimeter of the structure with handrail on the stairs. There is a Slide Gate with extended stem attached to the back concrete wall and an outlet pipe going thru the back wall of the structure to a harvest kettle. The typical Harvest Kettle is a specialized reinforced concrete structure with dimensions of 4 ft deep over a 14 ft x 16ft area (with 8in thick walls). Costs include all equipment necessary to install a reinforced concrete structure for water control, Aquaculture pond not included. Use Underground Outlet (620) for outlet pipe from the Outlet Structure and from the Harvest Kettle.

Before Situation:

In the before situation, an aquaculture producer has an existing aquaculture pond system that needs an Outlet Structure to manage water levels in the ponds, and or drain ponds and needs a Harvest Kettle for the harvest of fish.

After Situation:

Typical practice is a tapered concrete outlet structure with a 7.5ft back wall and side walls tapering down to the pond floor. The structure is reinforced concrete walls (1ft thick) and floor with a footprint of approximately 290 SF and Concrete stairs along 1 side. There is guardrail around the perimeter of the structure with a handrail on the stairs. There is a Gate valve with extended stem attached to the back concrete wall and an outlet pipe going thru the back wall of the structure to a Harvest Kettle where water is drained to and fish harvested from. The practice is installed using large earth moving equipment and concrete installed with labor. This practice will be installed with an existing Aquaculture pond. Use Livestock Pipeline (516) if needed to supply water to the Outlet Structure and Harvest Kettle. Drainage tile, if needed, will be installed according to Subsurface Drain (606). Liner if needed will be installed using Pond Sealing or Lining (520, 521 or 522). Other associated practices are Critical Area Planting (342), Fence (382), Underground Outlet (620), Mulching (484), Water Well (642), Pumping Plant (533), Livestock Pipeline (516), Heavy Use Area Protection (561), Access Road (560), Subsurface Drain (606), and Spoil Spreading (572) may also be needed and will be installed using those standards as appropriate. A reinforced concrete kettle measuring 4'x14'x16' with 8' thick walls and floor is constructed with 13CY of reinforced concrete. The practice is installed using large earth moving equipment and laborers. Other associated practices are; Underground Outlet (620), Livestock Pipeline (516), Water Well (642), Pumping Plant (533), Heavy Use Area Protection (561), Access Road (560)

Feature Measure: Height of Reinforced Concrete Outl

Scenario Unit: Feet

Scenario Typical Size: 7.50

Scenario Total Cost: $50,727.92

Scenario Cost/Unit: $6,763.72

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	30	$17,012.40
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	150	$937.50
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	14	$1,827.14
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	96	$2,756.16
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	14	$561.82
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	24	$1,166.40
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	150	$4,329.00
Irrigation, Screen	329	Screen device to prevent debris, fish or other wildlife from being drawn into irrigation systems. Types include self cleaning rotary drum, pump suction, or flat panel screens. Includes materials only.	Gallons per Minute	$6.53	2400	$15,672.00
Dimension Lumber, Treated	1044	Treated dimension lumber with nominal thickness equal or less than 2 inches. Includes lumber and fasteners	Board Feet	$1.79	160	$286.40

Structural steel tubing, 2 in. diameter	1120	Structural steel tubing, 2 inch diameter, 1/8 inch wall thickness, materials only	Feet	$4.35	341	$1,483.35
Steel, Angle, 2 1/2 in. x 2 1/2 in. x 1/4 in.	1372	Materials: Angle, 2 1/2 inch x 2 1/2 inch x 1/4 inch. Meets ASTM A36	Feet	$4.19	86	$360.34
Steel, Plate, 3/8 in.	1375	Flat steel plate, 3/8 inch thickness. Materials only.	Square Feet	$22.51	12	$270.12
Screw gate, cast iron, 18 in. diameter, 10/0 head	1917	18 inch diameter cast iron screw (canal) gate rated at 10 seating head 0 feet unseating head. Materials only.	Each	$1,469.86	1	$1,469.86
Welded Bar Grate, metal	1980	Heavy duty vertical bar welded grating, typically 1-1/4 x 3/16 in. bars on 1 in. spacing with cross rod on 4 in. spacing. Materials only.	Square Feet	$28.22	28	$790.16
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	200	$200.00
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	500	$500.00
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 587 - Structure for Water Control

Scenario: #13 - Drainage Water Management Structure

Scenario Description:
A subsurface drainage system on a field with a fairly flat slope (less than 2% and preferably less than 1%) outlets through a control structure which is operated with stoplogs. This allows the operator to keep the water in the soil profile when it is not critical to dry the soil. This retention time reduces the volume of water discharged and thereby the quantity of nutrients lost. A single stoplog structure may have its influence extended by buried float-activated structures which can be counted as structures also for a separate payment. Resource Concerns: Water Quality Degradation (Nutrients). Associated Practices: 606 - Subsurface Drain; 554 - Drainage Water Management

Before Situation:
The discharge from a subsurface drainage system enters ditches or streams, often laden with sediment and nutrients.

After Situation:
The discharge from a subsurface drainage system enters ditches or streams only when the soil profile needs to be dry. The retention time in the soil profile reduces volume of water and nutrients discharged. Typical affected area for a single structure is 10-20 acres.

Feature Measure: Number of Structures

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $3,465.32

Scenario Cost/Unit: $3,465.32

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	2	$132.36
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	2	$57.42
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	2	$97.20
Materials						
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.29	271.6	$621.96
Water Control Structure, Stoplog, Inline, fixed costs portion	2145	Fixed cost portion of Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Materials only.	Each	$367.01	1	$367.01
Water Control Structure, Stoplog, Inline, variable cost portion	2146	Variable cost portion of a Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Calculate total variable costs by multiplying by the structure height x pipe diameter. Materials only.	Height x Diameter	$18.68	60	$1,120.80
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 587 - Structure for Water Control

Scenario: #39 - Culvert <30 inches

Scenario Description:
Install a new HDPE culvert under 30 inches in diameter to convey water under roads or other barriers. A typical scenario would be an 24 inch diameter pipe, 40 feet in length. Work includes site preparation, acquiring and installing culvert pipe with gravel bedding and fill (compacted), and riprap protection of side slopes. Use (396) Aquatic Organism Passage when the primary intent is biological concerns, not hydrologic. Use (578) Stream Crossing for culverts = 30 inches or perennial flow.

Before Situation:
Water flow needs to be conveyed under an access road, ditch or other barrier. Water must be conveyed in a controlled fashion.

After Situation:
Water is conveyed in a controlled manner. Associated practices could be Access Road (560), Animal Trails and Walkways (575), Critical Area Planting (342), Drainage Water Management (554), Irrigation Canal or Lateral (320), Irrigation Pipeline (430), Irrigation Reservoir (436), Irrigation System, Surface and Subsurface (443), Irrigation System, Tailwater Recovery (447), Irrigation Water Management (449), Lined Waterway or Outlet (468), Obstruction Removal (500), Pond (378), Stormwater Runoff Control (570), Surface Drain, Field Ditch (607), Surface Drain, Main or Lateral (608), and Trails and Walkways (568).

Feature Measure: Pipe Diameter (In) x Pipe Length (Ft

Scenario Unit: Diameter Inch Foot

Scenario Typical Size: 960.00

Scenario Total Cost: $3,580.47

Scenario Cost/Unit: $3.73

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	5	$12.60
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	45	$281.25
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	10	$287.10
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement.	Cubic Yards	$136.88	2	$273.76
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	5	$151.80
Pipe, HDPE, corrugated double wall, GTE 15 in., soil tight, weight priced	1588	High Density Polyethylene (HDPE) compound manufactured into double wall corrugated pipe Greater Than or Equal to 15 inch diameter. Materials only.	Pound	$2.37	440.8	$1,044.70
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 587 - Structure for Water Control

Scenario: #63 - Harvest Kettle Gate

Scenario Description:
Installing a new slide gate with extended stem attached to a concrete wall in a new or existing aquaculture pond harvest kettle to manage water levels in the kettle. Costs include all equipment necessary to install a slide gate for water control.

Before Situation:
An aquaculture producer has an existing aquaculture pond system which has no control of water levels in an existing harvest kettle for the harvesting of fish.

After Situation:
Slide Gate with extended stem is installed to and existing harvest kettle. The practice is installed using small equipment and laborers. Other associated practices are Aquaculture Ponds (397), Critical Area Planting (342), Fence (382), Underground Outlet (620), Mulching (484), , Heavy Use Area Protection (561), Access Road (560), Subsurface Drain (606), and Spoil Spreading (572)

Feature Measure: Slide Gates installed

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $3,863.82

Scenario Cost/Unit: $3,863.82

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	4	$114.84
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	4	$194.40
Materials						
Screw gate, cast iron, 24 inch diameter, 20/10 head	2113	24 inch diameter cast iron screw (canal) gate rated at => 20 seating head, 10 feet unseating head. Materials only.	Each	$2,872.50	1	$2,872.50
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	500	$500.00
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08

Practice: 587 - Structure for Water Control

Scenario: #71 - Outlet Structure only for a New or an Existing Aquaculture Pond

Scenario Description:

An aquaculture pond that requires an Outlet Structure ONLY to manage water levels and drain water from the pond to allow fish to be move from the pond to a new or an existing Harvest Kettle area where the fish are removed from the water. Typical Outlet Structure is a tapered reinforced concrete outlet structure with a 10 ft back wall and side walls tapering down to the pond floor. The structure is made up of reinforced 10' thick concrete walls and floor with a footprint of approximately 960 SF for a total of 54 CY of concrete. There is guardrail around the perimeter of the structure. There is a Slide Gate with extended stem attached to the back concrete wall and an outlet pipe going thru the back wall of the structure to an existing harvest kettle. Typical installations are in remote locations. Costs include all equipment necessary to install a reinforced concrete outlet structure for water control, Aquaculture pond and harvest kettle are not included. Use Underground Outlet (620) for outlet pipe from the Outlet Structure.

Before Situation:

In the before situation, an aquaculture producer has an existing aquaculture pond with a harvest kettle without an Outlet Structure to manage water levels in the ponds, or the ability to drain pond.

After Situation:

Typical practice is a tapered concrete outlet structure with a 10 ft back wall and side walls tapering down to the pond floor. The structure is reinforced concrete walls (10' thick) and floor with a footprint of approximately 960 SF. There is guardrail around the perimeter of the structure. There is a Gate valve with extended stem attached to the back concrete wall and an outlet pipe going thru the back wall of the structure to an existing Harvest Kettle where water is drained to and fish harvested from. The practice is installed using large earth moving equipment, reinforced concrete, and onsite labor to install the outlet structure and associated screens. This water control structure will be installed on an existing Aquaculture pond. Use Livestock Pipeline (516) if needed to supply water to the Outlet Structure. Drainage tile, if needed, will be installed according to Subsurface Drain (606). Liner if needed will be installed using Pond Sealing or Lining (520, 521 or 522). Other associated practices may include; Aquaculture Ponds (397), Critical Area Planting (342), Fence (382), Underground Outlet (620), Mulching (484), Water Well (642), Pumping Plant (533), Livestock Pipeline (516), Heavy Use Area Protection (561), Access Road (560), Subsurface Drain (606), and Spoil Spreading (572).

Feature Measure: Aquaculture Pond Outlet Structure

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $44,666.28

Scenario Cost/Unit: $44,666.28

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	59	$33,457.72
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	119	$743.75
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	8	$1,044.08
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	30	$1,316.10
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	40	$1,148.40
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	8	$321.04
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	20	$972.00
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	20	$577.20
Structural steel tubing, 2 in. diameter	1120	Structural steel tubing, 2 inch diameter, 1/8 inch wall thickness, materials only	Feet	$4.35	46	$200.10
Steel, Plate, 3/8 in.	1375	Flat steel plate, 3/8 inch thickness. Materials only.	Square Feet	$22.51	76	$1,710.76
Screw gate, cast iron, 18 in. diameter, 10/0 head	1917	18 inch diameter cast iron screw (canal) gate rated at 10 seating head 0 feet unseating head. Materials only.	Each	$1,469.86	1	$1,469.86

Mobilization

Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	600	$600.00
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 587 - Structure for Water Control

Scenario: #303 - Culvert Guard, Grill or Fence

Scenario Description:
The beaver stop uses a system of cylindrical screens to prevent beaver from plugging pipe inlets with debris. Plugged pipe inlets may cause erosion due to frequent use of the auxilliary spillway or overtopping of the embankment.

Before Situation:
The required design flow rate through the pipe inlet may be restricted due to beaver activity.

After Situation:
The beaver stop system of cylindrical screens includes three 6-ft long screens joined together on the upstream end, and one 6-ft long screen on the downstream end. Then a 10-ft overlay screen fits over the main upstream cylinder. The typical pipe diameter is 24'. The beaver stop system prevents the beaver from plugging the inlet, and maintains the required design flow rate through the pipe inlet.

Feature Measure: Pipe Diameter

Scenario Unit: Inch

Scenario Typical Size: 24.00

Scenario Total Cost: $6,147.98

Scenario Cost/Unit: $256.17

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	5	$652.55
Truck, dump, 8 CY	1401	Dump truck for moving bulk material. Typically capacity is 12 ton or 8 cubic yards. Includes equipment only.	Hours	$55.22	3	$165.66
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	10	$287.10
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	8	$321.04
Materials						
Deactivated. Culvert Guard, Grill or Fence	2717	Description: Various device used to prevent debris and beavers from entering and damming culverts. Culvert guard 24 inches diameter 6-ft long cylindrical metal screens. Materials and shipping only.	Each	$3,957.00	1	$3,957.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 587 - Structure for Water Control

Scenario: #306 - Drainage Water Management- Inline Water Control Valve

Scenario Description:

A subsurface drainage system on a field with a fairly flat slope (less than 2% and preferably less than 1%) outlets through a control structure which is operated with stoplogs. The inline valve allows the operator to control the water level up stream of the stop log structure in the soil profile when it is not critical to dry the soil. This retention time reduces the volume of water discharged and thereby the quantity of nutrients lost. A buried float-activated inline valve can influence the extent of the single stoplog structure. Resource Concerns: Water Quality Degradation (Nutrients). Associated Practices: 606 - Subsurface Drain; 554 - Drainage Water Management

Before Situation:

The discharge from a subsurface drainage system enters ditches or streams, often laden with sediment and nutrients. The existing DWM has limited affect of retaining water within the whole DWM system.

After Situation:

The discharge from a subsurface drainage system enters ditches or streams only when the soil profile needs to be dry. The retention time in the soil profile reduces volume of water and nutrients discharged. Typical affected area for a single structure is 10-20 acres. A buried inline float-activated control valve enhances the influence of the single stoplog structure and drainage water management effective the whole DWM acres.

Feature Measure: Number of Water Control Valves

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $2,157.56

Scenario Cost/Unit: $2,157.56

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	1	$66.18
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	2	$57.42
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	1	$40.13
Materials						
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.29	271.6	$621.96
Water Level Control Valve, Inline	2189	Automatic float valve for drainage pipes up to 8 inch dia. To maintain head differential in flowing agricultural drains.	Each	$607.24	1	$607.24
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 587 - Structure for Water Control

Scenario: #307 - Subsurface Drainage Control Structure-for a waste storage pond

Scenario Description:

A subsurface drainage control structure is used as part of a perimeter or under drainage system associated with a waste storage pond. The perimeter or under drainage system lowers a perched water table to protect the waste storage pond liner. A controlled drainage structure is used as an observation point and also allows nutrient rich water to be pumped back into the waste storage pond in lieu of discharging into surface waters. This controlled drainage structure uses a manhole structure with a 2 gate valves for water control. This scenario is used as part of a waste storage or aquaculture pond subsurface drainage system to convey perched groundwater through a pipeline or pump to an outlet (storage facility or pond). Associated practices; (313) Waste Storage Facility, (606) Subsurface Drain, (634) Waste Transfer, (533) Pumping Plant, (397) Aquaculture Ponds.

Before Situation:

The discharge from a subsurface drainage system enters ditches or streams, often laden with nutrients.

After Situation:

The subsurface control drainage system installs a manhole with a 2 gate valves is as part of a 313 Waste Storage Facility or 397- Aquaculture Pond to control and convey perched groundwater from a sandy soil profile that is confined between clay soil layers through a conveyance pipeline using CPS 606 Subsurface Drain. The manhole provides an observation point where the perched groundwater can be redirected back into the storage facility or pond or conveyed by pipeline or pump to a suitable outlet.

Feature Measure: Number of Structures

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $4,031.28

Scenario Cost/Unit: $4,031.28

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Ball Valve, 4 in.	1726	4 inch ball valve, metal body. Materials only.	Each	$229.11	2	$458.22
Manhole, 4 ft x 10 ft	2136	Precast Manhole with base and top delivered. 4 feet diameter x 10 feet depth. Includes materials, equipment and labor.	Each	$3,573.06	1	$3,573.06

Practice: 587 - Structure for Water Control

Scenario: #328 - External Harvest Kettle ONLY for an Existing Aquaculture Pond

Scenario Description:
Install a Harvest Kettle to manage water levels and drain water from an existing Aquaculture pond where the fish are removed from the water. The typical Harvest Kettle is a specialized reinforced concrete structure with dimensions of 5 ft deep over a 14'-4' x 16'-2' area (with 8in thick walls). Costs include all equipment necessary to install a reinforced concrete structure for water control, Use Underground Outlet (620) for outlet pipe from the the Harvest Kettle.

Before Situation:
An existing aquaculture pond system has no Harvest Kettle for the harvesting of fish. Fish are harvested from the pond itself using nets and buckets.

After Situation:
A reinforced concrete kettle with outside dimensions measuring 5'x14'-4'x16'-2' with 8' thick walls and 10' thick floor is constructed with 19 CY of reinforced concrete. The practice is installed using large earth moving equipment, reinforced concrete and onsite labor to fabricate and install the structure. Drainage tile, if needed, will be installed according to Subsurface Drain (606). Other associated practices may include; Aquaculture Ponds (397), Critical Area Planting (342), Fence (382), Underground Outlet (620), Mulching (484), Heavy Use Area Protection (561), Access Road (560), Subsurface Drain (606), and Spoil Spreading (572).

Feature Measure: Harvest Kettle Structure

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $23,632.85

Scenario Cost/Unit: $23,632.85

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	19	$10,774.52
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	84	$525.00
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	8	$1,044.08
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	60	$2,632.20
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	20	$574.20
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	8	$321.04
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	10	$486.00
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	6	$173.16
Structural steel tubing, 2 in. diameter	1120	Structural steel tubing, 2 inch diameter, 1/8 inch wall thickness, materials only	Feet	$4.35	70	$304.50
Steel, Angle, 2 1/2 in. x 2 1/2 in. x 1/4 in.	1372	Materials: Angle, 2 1/2 inch x 2 1/2 inch x 1/4 inch. Meets ASTM A36	Feet	$4.19	32	$134.08
Steel, Plate, 3/8 in.	1375	Flat steel plate, 3/8 inch thickness. Materials only.	Square Feet	$22.51	120	$2,701.20
Welded Bar Grate, metal	1980	Heavy duty vertical bar welded grating, typically 1-1/4 x 3/16 in. bars on 1 in. spacing with cross rod on 4 in. spacing. Materials only.	Square Feet	$28.22	80	$2,257.60
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	600	$600.00

Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 587 - Structure for Water Control

Scenario: #343 - Automated DWM Control Structure, 12 to 18 inch diameter pipe

Scenario Description:
A subsurface drainage system on a field with a fairly flat slope (less than 2% and preferably less than 1%) that outlets through a control structure which is operated with an automated slide gate and accommodates 12 to 18 inch diameter pipe sizes. This structure configuration facilitates meeting the conservation practice standard 554 - Drainage Water Management by managing the subsurface water table year-round. This allows the operator to keep the water in the soil profile when it is not critical to dry the soil for crop health or field operations. This retention time reduces the volume of water discharged and thereby the quantity of nutrients lost. A single automated structure may have its influence extended by buried float-activated structures to provide a greater area of control. Resource Concerns: Water Quality Degradation (Nutrients). Associated Practices: 606 - Subsurface Drain; 554 - Drainage Water Management

Before Situation:
Uncontrolled discharge from a subsurface drainage system enters ditches or streams, often laden with sediment and nutrients.

After Situation:
The water surface profile in the subsurface drainage system is managed in a manner which retains moisture in the soil for plant update and to allow for enhanced nutrient utilization. The use of automated control structures allow water levels to be monitored and adjusted remotely to allow for more active management in accordance with the drainage systems Drainage Water Management plan. Typical affected area for a single structure is 10 to 20 acres. A single structure with an automated slide gate may have its influence extended by use of buried float-activated control structures.

Feature Measure: Number of Structures

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $11,077.16

Scenario Cost/Unit: $11,077.16

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	2	$132.36
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	3	$131.61
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	2	$57.42
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	2	$60.72
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	2	$97.20
Materials						
Switches and Controls, programmable controller	1193	Programmable logic controller (with or without wireless telecommunications) commonly used to control pumps and irrigation systems	Each	$623.08	1	$623.08
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.29	567.6	$1,299.80
Data Logger with Telemetry System	1454	Data Logger W/Graphic Output for water management and telemetry - data communication device with power supply in a weather proof enclosure. Equipment only.	Each	$1,663.47	1	$1,663.47
Water Control Structure, Stoplog, Inline, fixed costs portion	2145	Fixed cost portion of Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Materials only.	Each	$367.01	1	$367.01
Water Control Structure, Stoplog, Inline, variable cost portion	2146	Variable cost portion of a Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Calculate total variable costs by multiplying by the structure height x pipe diameter. Materials only.	Height x Diameter	$18.68	113	$2,110.84
Valve, Inline, => 12 inch dia.	2368	Inline valve greater than or equal to 12 inch diameter to control direction and volume of flow within a pipeline system. Materials only.	Each	$3,616.83	1	$3,616.83
Light Duty Linear Actuator	2724	12VDC aluminum light duty linear actuator with 12??? stroke and potentiometer. 110 lb dynamic load rating with 20:1 gear ratio, 500 lb static load rating.	Each	$152.19	1	$152.19
Mobilization						

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 587 - Structure for Water Control

Scenario: #359 - Automation Retrofit to Manual Drainage Water Management Control Structure

Scenario Description:
A subsurface drainage system on a field with a fairly flat slope (less than 2% and preferably less than 1%) that outlets through a control structure which has been retrofitted to operate with an automated slide gate. This structure configuration facilitates meeting the conservation practice standard 554 - Drainage Water Management by managing the subsurface water table year-round. This allows the operator to keep the water in the soil profile when it is not critical to dry the soil for crop health or field operations. This retention time reduces the volume of water discharged and thereby the quantity of nutrients lost. A single retrofitted automated retrofit structure may have its influence extended by buried float-activated structures to provide a greater area of control. Resource Concerns: Field Sediment, Nutrient and Pathogen Loss. Associated Practices: 606 - Subsurface Drain; 554 - Drainage Water Management.

Before Situation:
Control structure with manually operated slide gate.

After Situation:
The water surface profile in the subsurface drainage system is managed in a manner which retains moisture in the soil for plant update and to allow for enhanced nutrient utilization. The use of retrofitted control structures for automated slide gate operation allow water levels to be monitored and adjusted remotely to allow for more active management in accordance with the drainage systems Drainage Water Management plan. Typical affected area for a single structure is 10 to 20 acres. A single structure with a retrofitted automated slide gate may have its influence extended by use of buried float-activated control structures.

Feature Measure: Number of Structures

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $5,318.97

Scenario Cost/Unit: $5,318.97

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	4	$175.48
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	4	$114.84
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	4	$194.40
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	2	$222.90
Materials						
Solar Panels, fixed cost portion	1031	Fixed cost portion of the Solar Panels. This portion is a base cost for all Solar Panels and is not dependent on Kilowatt. The total cost of any Solar Panels will include this fixed cost plus a variable cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drops and etc.).	Each	$859.26	1	$859.26
Solar Panels, variable cost portion	1135	Variable cost portion of the Solar Panels. This portion IS dependent on the total Kilowatt for the Solar Panels. The total cost of Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drop, etc.). Includes materials only.	Kilowatt	$2,563.62	0.25	$640.91
Switches and Controls, programmable controller	1193	Programmable logic controller (with or without wireless telecommunications) commonly used to control pumps and irrigation systems	Each	$623.08	1	$623.08
Data Logger with Telemetry System	1454	Data Logger W/Graphic Output for water management and telemetry - data communication device with power supply in a weather proof enclosure. Equipment only.	Each	$1,663.47	1	$1,663.47
Battery Bank, Hydroelectric	2593	Device used to provide a way to store surplus energy when more is being produced than consumed. When demand increases beyond what is generated, the batteries can be called on to release energy to keep household loads operating. Includes materials and shipping only.	Each	$672.44	1	$672.44
Light Duty Linear Actuator	2724	12VDC aluminum light duty linear actuator with 12??? stroke and potentiometer. 110 lb dynamic load rating with 20:1 gear ratio, 500 lb static load rating.	Each	$152.19	1	$152.19

Practice: 587 - Structure for Water Control

Scenario: #421 - Automated DWM Control Structure, 6 to 10 inch diameter pipe

Scenario Description:

A subsurface drainage system on a field with a fairly flat slope (less than 2% and preferably less than 1%) that outlets through a control structure which is operated with an automated slide gate and accommodates 6 to 10 inch diameter pipe sizes. This structure configuration facilitates meeting the conservation practice standard 554 - Drainage Water Management by managing the subsurface water table year-round. This allows the operator to keep the water in the soil profile when it is not critical to dry the soil for crop health or field operations. This retention time reduces the volume of water discharged and thereby the quantity of nutrients lost. A single automated structure may have its influence extended by buried float-activated structures to provide a greater area of control. Resource Concerns: Water Quality Degradation (Nutrients). Associated Practices: 606 - Subsurface Drain; 554 - Drainage Water Management

Before Situation:

Uncontrolled discharge from a subsurface drainage system enters ditches or streams, often laden with sediment and nutrients.

After Situation:

The water surface profile in the subsurface drainage system is managed in a manner which retains moisture in the soil for plant update and to allow for enhanced nutrient utilization. The use of automated control structures allow water levels to be monitored and adjusted remotely to allow for more active management in accordance with the drainage systems Drainage Water Management plan. Typical affected area for a single structure is 10 to 20 acres. A single structure with an automated slide gate may have its influence extended by use of buried float-activated control structures.

Feature Measure: Number of Structures

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $6,261.22

Scenario Cost/Unit: $6,261.22

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	2	$132.36
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	3	$131.61
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	2	$57.42
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	2	$60.72
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	2	$97.20
Materials						
Switches and Controls, programmable controller	1193	Programmable logic controller (with or without wireless telecommunications) commonly used to control pumps and irrigation systems	Each	$623.08	1	$623.08
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.29	271.6	$621.96
Data Logger with Telemetry System	1454	Data Logger W/Graphic Output for water management and telemetry - data communication device with power supply in a weather proof enclosure. Equipment only.	Each	$1,663.47	1	$1,663.47
Water Control Structure, Stoplog, Inline, fixed costs portion	2145	Fixed cost portion of Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Materials only.	Each	$367.01	1	$367.01
Water Control Structure, Stoplog, Inline, variable cost portion	2146	Variable cost portion of a Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Calculate total variable costs by multiplying by the structure height x pipe diameter. Materials only.	Height x Diameter	$18.68	60	$1,120.80
Valve, Inline, < 12 inch dia.	2367	Inline valve less than 12 inch diameter to control direction and volume of flow within a pipeline system. Materials only.	Each	$468.77	1	$468.77
Light Duty Linear Actuator	2724	12VDC aluminum light duty linear actuator with 12??? stroke and potentiometer. 110 lb dynamic load rating with 20:1 gear ratio, 500 lb static load rating.	Each	$152.19	1	$152.19
Mobilization						

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 587 - Structure for Water Control

Scenario: #464 - Inlet Flashboard Riser, Metal

Scenario Description:

A Flashboard Riser fabricated of metal and used in a water management system that maintains a desired water surface elevation, controls the direction or rate of flow, or conveys water to address the resource concerns: Inadequate Water - Inefficient use of Irrigation Water and Inadequate habitat for Fish and Wildlife. The water surface elevation is controlled by addition or removal of slats or 'stoplogs'. This scenario is applicable to variable crest weir structures where the elevation is controlled at the inlet (Half-Rounds). They are often fabricated from half pipes (i.e. half-rounds) or sheet steel in a box shape. Payment rate is based upon the Flashboard Weir Length in inches multiplied by the outlet length in feet (Inch-Foot). Cost estimate is based on a 'Half-Round' flashboard riser shop fabricated using a longitudinal cut 36' smooth steel pipe, a 50' long - 30' outlet pipe passing through an embankment.

Before Situation:

The operator presently flood irrigates his field and has no means to accurately maintain a constant water level at varying elevations resulting in a lack of flexibility, and inefficient use of water and energy during pumping. The operator also desires to maintain a permanent pool for water fowl during the winter.

After Situation:

The operator has the capability to more efficiently control and maintain a range of water surface elevations thereby reducing the flow rate needed. Less water is wasted and both water and energy is conserved. The operator is now able to maintain adequate water during the winter as a benefit to waterfowl. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Irrigation Water Management (449), Irrigation Land Leveling (464), Irrigation Canal or Lateral (320), Irrigation System, Tailwater Recovery (447), Dike (356), and Grade Stabilization Structure (410) will use the corresponding Standard(s) as appropriate.

Feature Measure: Flashboard Weir Length (in) x barre

Scenario Unit: Diameter Inch Foot

Scenario Typical Size: 1,800.00

Scenario Total Cost: $9,265.96

Scenario Cost/Unit: $5.15

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	190	$761.90
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	10	$62.50
Hydraulic Excavator, .5 CY	930	Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included.	Hours	$101.18	2	$202.36
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	5	$219.35
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	6	$172.26
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	2	$80.26
Materials						
Steel, Angle, 2 1/2 in. x 2 1/2 in. x 1/4 in.	1372	Materials: Angle, 2 1/2 inch x 2 1/2 inch x 1/4 inch. Meets ASTM A36	Feet	$4.19	24	$100.56
Steel, Plate, 3/8 in.	1375	Flat steel plate, 3/8 inch thickness. Materials only.	Square Feet	$22.51	4	$90.04
Lumber, planks, posts and timbers, treated	1609	Treated dimension lumber with nominal thickness greater than 2 inches. Includes lumber and fasteners. Does not include labor.	Board Feet	$3.53	32	$112.96
Pipe, Steel, Std Wt., Used, weight priced	2870	Schedule 40 steel pipe, used. Materials only.	Pound	$0.96	6788.6	$6,517.06
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 587 - Structure for Water Control

Scenario: #465 - Inline Flashboard Riser, Metal

Scenario Description:

A Flashboard Riser fabricated of metal and used in a water management system that maintains a desired water surface elevation, controls the direction or rate of flow, or conveys water to address the resource concerns: Inadequate Water - Inefficient use of Irrigation Water and Inadequate habitat for Fish and Wildlife. The water surface elevation is controlled by addition or removal of slats or 'stoplogs'. This scenario is applicable to variable crest weir structures where the elevation is controlled at the embankment. They are often fabricated from vertical pipes with the stoplogs are located in the middle (i.e. Full-Rounds) or sheet steel in a box shape. Payment rate is based upon the Flashboard Weir Length in inches multiplied by the outlet length in feet (Inch-Foot). Cost estimate is based on a 'Half-Round' flashboard riser shop fabricated using a longitudinal cut 36' smooth steel pipe, a 50' long - 30' outlet pipe passing through an embankment.

Before Situation:

The operator presently flood irrigates his field and has no means to accurately maintain a constant water level at varying elevations resulting in a lack of flexibility, and inefficient use of water and energy during pumping. The operator also desires to maintain a permanent pool for water fowl during the winter.

After Situation:

The operator has the capability to more efficiently control and maintain a range of water surface elevations thereby reducing the flow rate needed. Less water is wasted and both water and energy is conserved. The operator is now able to maintain adequate water during the winter as a benefit to waterfowl. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Irrigation Water Management (449), Irrigation Land Leveling (464), Irrigation Canal or Lateral (320), Irrigation System, Tailwater Recovery (447), Dike (356), and Grade Stabilization Structure (410) will use the corresponding Standard(s) as appropriate.

Feature Measure: Flashboard Weir Length (in) x Barre

Scenario Unit: Diameter Inch Foot

Scenario Typical Size: 1,800.00

Scenario Total Cost: $9,559.43

Scenario Cost/Unit: $5.31

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	190	$761.90
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	15	$93.75
Hydraulic Excavator, .5 CY	930	Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included.	Hours	$101.18	4	$404.72
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	7	$307.09
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	10	$287.10
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	4	$160.52
Materials						
Steel, Angle, 2 1/2 in. x 2 1/2 in. x 1/4 in.	1372	Materials: Angle, 2 1/2 inch x 2 1/2 inch x 1/4 inch. Meets ASTM A36	Feet	$4.19	24	$100.56
Steel, Plate, 3/8 in.	1375	Flat steel plate, 3/8 inch thickness. Materials only.	Square Feet	$22.51	10	$225.10
Lumber, planks, posts and timbers, treated	1609	Treated dimension lumber with nominal thickness greater than 2 inches. Includes lumber and fasteners. Does not include labor.	Board Feet	$3.53	4	$14.12
Pipe, Steel, Std Wt., Used, weight priced	2870	Schedule 40 steel pipe, used. Materials only.	Pound	$0.96	6518.6	$6,257.86
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 587 - Structure for Water Control

Scenario: #466 - Commercial Inline Flashboard Riser

Scenario Description:

An Inline Water Control Structure (WCS) composed of plastic that maintains a desired water surface elevation, controls the direction or rate of flow, or conveys water to address the resource concern: Inadequate habitat for Fish and Wildlife. The water surface elevation is controlled by addition or removal of slats or 'stoplogs'. This scenario is applicable to variable crest weir structures where the elevation is controlled at point along a pipe extending through an embankment, providing ease of access to the structure and provide better protection against beaver activity. There are commercially available models composed of plastic that are commonly used when the width of the is 24' or less. Payment rate is based upon the Flashboard Weir Length in inches multiplied by the outlet length in feet (Inch-Foot). Cost estimate is based on a using a such a commercial product. The typical scenario is an inline structure with a width of 20', height of six feet, The pipe is 50' of 15' SCH 40 PVC (inlet and outlet combined).

Before Situation:

The landowner wishes to provide for a way to control the water surface elevation in a wetland area. The landowner wishes to enhance and enlarge the area to provide habitat for fish and wildlife.

After Situation:

A WCS is installed in a flow line allowing shallow water impoundments. A wetland area is enhanced and water levels can be varied to better accommodate wildlife needs. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Wetland Creation (658), Wetland Enhancement (659) Wetland Wildlife Habitat Management (644), Dike (356), and Grade Stabilization Structure (410) will use the corresponding Standard(s) as appropriate.

Feature Measure: Flashboard Weir Length (in) x Barre

Scenario Unit: Diameter Inch Foot

Scenario Typical Size: 1,000.00

Scenario Total Cost: $5,393.50

Scenario Cost/Unit: $5.39

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	190	$761.90
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	15	$93.75
Hydraulic Excavator, .5 CY	930	Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included.	Hours	$101.18	2	$202.36
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	3	$131.61
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	2	$80.26
Materials						
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.29	1287	$2,947.23
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 587 - Structure for Water Control

Scenario: #467 - Slide Gate

Scenario Description:
This scenario is the installation of a permanent slide gate structure to control the conveyance of water. The typical size is a 4' diameter opening. The slide gate may be installed on an open channel or pipeline. The slide gate is made of steel and has a hand operated mechanical lifting system, i.e. screw. This scenario assists in addressing the resource concerns: water management. Conservation practices that may be associated are: 533-Pumping Plant.

Before Situation:
A channel or pipeline is in need of a head gate to control the flow of water.

After Situation:
A 4' slide gate is installed and operated by hand is installed.

Feature Measure: diameter

Scenario Unit: Feet

Scenario Typical Size: 4.00

Scenario Total Cost: $9,670.93

Scenario Cost/Unit: $2,417.73

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	6	$397.08
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	12	$526.44
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	12	$344.52
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	6	$240.78
Materials						
Screw gate, cast iron, 4 ft. diameter, 10/0 head	1746	4 ft. diameter cast iron screw (canal) gate rated at 10 seating head 0 feet unseating head. Includes materials only.	Each	$7,397.48	1	$7,397.48
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 587 - Structure for Water Control

Scenario: #468 - Flap Gate

Scenario Description:
This scenario is the installation of a permanent flap (tide) gate structure to control the direction of flow resulting from tides or high water or back-flow from flooding. The typical size is a 4' diameter opening. The gate may be installed on an open channel or pipeline. It is made of steel and operates automatically. This scenario assists in addressing the resource concerns: water management. Conservation practices that may be associated are:

Before Situation:
A wetland or other area is in need of a flap gate to control the direction of the water.

After Situation:
A flap gate 4' wide is installed.

Feature Measure: Feet Diameter (of Gate)

Scenario Unit: Feet

Scenario Typical Size: 4.00

Scenario Total Cost: $10,228.12

Scenario Cost/Unit: $2,557.03

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	6	$397.08
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	12	$526.44
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	12	$344.52
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	6	$240.78
Materials						
Flap Gate, cast iron, 4 ft. diameter	1745	4 ft. diameter cast iron flap gate. Materials only.	Each	$7,954.67	1	$7,954.67
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 587 - Structure for Water Control

Scenario: #469 - Flap Gate w/ Concrete Wall

Scenario Description:
Install a concrete cut off wall with tide gate at the outlet of a channel. A typical scenario would be installed in a 25 foot channel, 6 foot deep, with 2:1 side slopes. A concrete wall will extend 10 feet on each side, and include a 4' flap gate structure to control flooding. Work includes site preparation, forming and pouring concrete, backfilling and acquiring and installing the tide gate.

Before Situation:
Tides or flooding inundate and affect water quality of wetlands or other managed systems.

After Situation:
Tide or flood inundation is controlled. Associated practices could be Aquaculture Ponds (397), Aquatic Organism Passage (396), Bivalve Aquaculture Gear and Biofouling Control (400), Constructed Wetland (656), Drainage Water Management (554), Irrigation Canal or Lateral (320), Irrigation Field Ditch (388), Irrigation System, Surface and Subsurface (443), Irrigation Water Management (449), Salinity and Sodic Soil Management (610), Subsurface Drain (606), Surface Drain, Field Ditch (607), Surface Drain, Main or Lateral (608), Wetland Creation (658), Wetland Enhancement (659), Wetland Restoration (657), and Wetland Wildlife Habitat Management (644).

Feature Measure: Cubic Yards of Concrete

Scenario Unit: Cubic Yards

Scenario Typical Size: 10.00

Scenario Total Cost: $15,104.33

Scenario Cost/Unit: $1,510.43

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	10	$5,670.80
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	200	$504.00
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	200	$802.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	2	$57.42
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	4	$115.44
Flap Gate, cast iron, 4 ft. diameter	1745	4 ft. diameter cast iron flap gate. Materials only.	Each	$7,954.67	1	$7,954.67

Practice: 587 - Structure for Water Control

Scenario: #470 - Rock Checks for Water Surface Profile

Scenario Description:

Typical setting is in a stream that has become incised and is therefore disconnected from the floodplain. Typical installation consists of installing a 'Vee' shaped rock structures with points facing upstream for the purpose of raising the water surface profile. Cost estimate is for three check dams with a top width of 3', max height of 6', min height of 3', and 28' length; containing an average of 58 cubic yards or 29 tons of rock for a total of 87 tons. The check dams are underlain with geotextile fabric. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as water quality degradation and soil erosion-concentrated flow erosion.

Before Situation:

The stream presently is incised with near vertical banks caused by bank toe erosion and sloughing. This condition has caused the floodplains to be disconnected from the stream, with only floods well above normal high-water escaping the high banks of the stream.

After Situation:

Banks are stabilized, and pools are created raising the Water Surface Profile elevation and effectively reducing the slope. Riffle pool scheme is restored and banks are protected. Water quality is protected downstream due to erosion protection, and wetland features are restored in the floodplain. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Streambank and Shoreline Protection (580), Channel Bed Stabilization (584), Stream Habitat Improvement and Management (395), and Wetland Wildlife Habitat Management (644) will use the corresponding Standard(s) as appropriate.

Feature Measure: Tons of rock installed

Scenario Unit: Ton

Scenario Typical Size: 87.00

Scenario Total Cost: $9,086.07

Scenario Cost/Unit: $104.44

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, common earth, large equipment, 50 ft	1222	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yards	$1.56	84	$131.04
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement.	Cubic Yards	$136.88	57	$7,802.16
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 587 - Structure for Water Control

Scenario: #471 - In-Stream Structure for Water Surface Profile

Scenario Description:

Typical setting is in a stream that has become incised and is therefore disconnected from the floodplain. Typical installation consists of installing a 'Vee' shaped concrete structure which points facing upstream for the purpose of raising the water surface profile. Cost estimate is for one cross vane with a effective length (Streambed width) of 36', and total length of 65', effective height of 3', max height of 6', and a 3' by 1.5' footer; containing 19 cubic yards of Concrete. Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as water quality degradation and soil erosion-concentrated flow erosion.

Before Situation:

The stream presently is incised with near vertical banks caused by bank toe erosion and sloughing. This condition has caused the floodplains to be disconnected from the stream, with only floods well above normal high-water escaping the high banks of the stream.

After Situation:

Banks are stabilized, and pools are created raising the water surface elevation and effectively reducing the slope. Riffle pool scheme is restored and banks are protected. Water quality is protected downstream due to erosion protection, and wetland features are restored in the floodplain. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Streambank and Shoreline Protection (580) Channel Bed Stabilization (584), Stream Habitat Improvement and Management (395), and Wetland Wildlife Habitat Management (644) will use the corresponding Standard(s) as appropriate.

Feature Measure: Streambed Width

Scenario Unit: Feet

Scenario Typical Size: 36.00

Scenario Total Cost: $12,848.18

Scenario Cost/Unit: $356.89

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	19	$10,774.52
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	18	$45.36
Water management, Flooding & dewatering	969	Includes equipment and power unit. Labor not included.	Acre Feet	$295.73	1	$295.73
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	10	$287.10
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	7	$340.20
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 587 - Structure for Water Control

Scenario: #472 - CMP Turnout

Scenario Description:
A corrugated metal pipe (CMP) equipped with a slide gate diverts water from a ditch or canal into a field or field ditch. This scenario is for a 15 inch diameter gate and pipe that will transmit approximately 4 cfs of flow.

Before Situation:
A ditch or canal exists, but a means to move water from the ditch into a smaller ditch or field does not exist. A water supply of sufficient quantity and quality is available for irrigation.

After Situation:
Water is diverted from a canal or ditch to meet irrigation requirements. A 15 inch diameter CMP is installed through the canal containment dike,. A 15 inch diameter slide gate is attached to the upstream end of the pipe. The top of the pipe inlet is below canal water surface elevation.

Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $1,520.62

Scenario Cost/Unit: $1,520.62

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	2	$132.36
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	5	$143.55
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	3	$91.08
Materials						
Pipe, CMP, 18-16 gauge, weight priced	1322	18 and 16 gauge galvanized helical corrugated metal pipe priced by the weight of the pipe materials. Materials only.	Pound	$2.00	94	$188.00
Slide gate, steel, 1 ft. diameter, low head	1830	1 ft. diameter steel slide gate for low head installations	Each	$201.00	1	$201.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 587 - Structure for Water Control

Scenario: #473 - Concrete Turnout Structure - Small

Scenario Description:
A reinforced concrete turnout structure equipped with slide boards or panels diverts irrigation water from a ditch or canal into a field or field ditch. This scenario is for a four ft tall, two foot wide, and five foot long turnout structure.

Before Situation:
A ditch or canal exists, but a means to move water from the ditch into a smaller ditch or field does not exist. A water supply of sufficient quantity and quality is available for irrigation.

After Situation:
Water is diverted from a canal or ditch to meet irrigation requirements. A two foot wide and four foot tall turnout structure equipped with slots for slide boards and panels conducts water through the canal berm into a field. The concrete structure is five feet long and has an end sill. All footings, floors. and walls have a minimum thickness of six inches. The structure delivers water to field elevation or ditch bottom elevation. The top of the pipe inlet is below canal water surface elevation.

Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $2,025.69

Scenario Cost/Unit: $2,025.69

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	2	$1,134.16
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	1	$66.18
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	2	$60.72
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 587 - Structure for Water Control

Scenario: #474 - Concrete Turnout Structure

Scenario Description:
A reinforced concrete turnout structure equipped with a 48 inch screw gate diverts irrigation water from a canal into a field or field ditch. This scenario is for a six ft tall, eight foot wide, and ten foot long turnout structure. A sloping trash rack fabricated from rebar is installed on the inlet. If needed fish screens may be installed at the inlet..

Before Situation:
A delivery canal exists, but a means to move water from the canal into a smaller ditch or field does not exist. A water supply of sufficient quantity and quality is available for irrigation.

After Situation:
Water is diverted from a canal to meet irrigation requirements. A eight foot wide and six foot tall turnout structure equipped with a 48 inch slide gate conducts water through the canal berm. The concrete structure is ten feet long and has an end sill. All footings, floors. and walls have a minimum thickness of six inches. The structure delivers water to field or ditch bottom elevation.

Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $13,055.69

Scenario Cost/Unit: $13,055.69

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	5	$2,835.40
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	4	$264.72
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	10	$287.10
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	5	$151.80
Materials						
Screw gate, cast iron, 4 ft. diameter, 10/0 head	1746	4 ft. diameter cast iron screw (canal) gate rated at 10 seating head 0 feet unseating head. Includes materials only.	Each	$7,397.48	1	$7,397.48
Welded Bar Grate, metal	1980	Heavy duty vertical bar welded grating, typically 1-1/4 x 3/16 in. bars on 1 in. spacing with cross rod on 4 in. spacing. Materials only.	Square Feet	$28.22	48	$1,354.56
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 587 - Structure for Water Control

Scenario: #475 - Flow Meter with Mechanical Index

Scenario Description:

Permanently installed water flow meter with mechanical, cumulative volume and rate index. Meters can be any flow measurement device that meets CPS 433, (i.e. meters: turbine, propeller, acoustic, magnetic, venturi, orifice, etc.) with or without straightening vanes. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, and Degraded Plant Condition - Undesirable plantproductivity and health, and Inefficient Energy Use - Equipment and facilitiesAssociated Practices: 533-Pumping Plant, 449-Irrigation Water Management, 441-Irrigation System, Microirrigation, 443-Irrigation System Surface and Subsurface, 442-Irrigation System, Sprinkler, 328-Conservation Crop Rotation, 634-Waste Transfer, and 590-Nutrient Management.

Before Situation:

Producer estimates seasonal and individual irrigation application flow rate and volumes based on energy costs, system operating pressure, or other means.

After Situation:

Producer is able to access instantaneous rate and cumulative flow volume data at the meter location. The information gained will enable the irrigator to improve irrigation water management, recognize system performance issues before they become critical, and reduce energy use.

Feature Measure: Nominal Diameter of Meter

Scenario Unit: Inch

Scenario Typical Size: 10.00

Scenario Total Cost: $2,106.24

Scenario Cost/Unit: $210.62

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Flow Meter, with mechanical Index	1450	10 inch, Turbine Type Flow Meter with Mechanical Index, permanently installed. Includes materials and shipping only.	Each	$1,742.08	1	$1,742.08
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	2	$364.16

Practice: 587 - Structure for Water Control

Scenario: #476 - Flow Meter with Electronic Index

Scenario Description:

Permanently installed water flow meter with an electronic index . Meters can be any flow measurement device that meets CPS 433, (i.e., meters: turbine, propeller, acoustic, magnetic, venturi, orifice, etc.) with or without straightening vanes or data logging capability. Meter nominal diameter for insert type turbine meters will be installation pipe size. Typical installation would include installation of a 10 inch turbine flow meter, with electronic index output. Resource Concerns: Insufficient Water - Inefficient use of irrigation water, and Degraded Plant Condition - Undesirable plantproductivity and health, and Inefficient Energy Use - Equipment and facilitiesAssociated Practices: 533-Pumping Plant, 449-Irrigation Water Management, 441-Irrigation System, Microirrigation, 443-Irrigation System Surface and Subsurface, 442-Irrigation System, Sprinkler, 328-Conservation Crop Rotation, 634-Waster Transfer, and 590-Nutrient Management.

Before Situation:

Producer estimates seasonal and individual irrigation application flow rate and volumes based on energy costs, system operating pressure, or other means.

After Situation:

Producer is able to access instantaneous rate and cumulative flow volume data at the meter location. The information gained will enable the irrigator to improve irrigation water management, recognize system performance issues before they become critical, and reduce energy use.

Feature Measure: Nominal Diameter of Meter

Scenario Unit: Inch

Scenario Typical Size: 10.00

Scenario Total Cost: $3,992.80

Scenario Cost/Unit: $399.28

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Flow Meter, with Electronic Index	1452	10 inch Turbine Irrigation flow meter, with Electronic Index, Rate and Volume, permanently installed. Materials only.	Each	$3,628.64	1	$3,628.64
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	2	$364.16

Practice: 587 - Structure for Water Control

Scenario: #477 - Flow Meter with Electronic Index & Telemetry

Scenario Description:

Permanently installed water flow meter with an electronic flow rate and volume index and data telemetry transmission system. Meters can be any flow measurement device that meets CPS 433, (i.e. meters: turbine, propeller, acoustic, magnetic, venturi, orifice, etc.) with or without straightening vanes. Meter nominal diameter for insert type turbine meters will be installation pipe size. Typical installation would include installation of a 10 inch magnetic flow meter, with electronic index output and telemetry data transfer system for monitoring irrigation system flow rate.Resource Concerns: Insufficient Water - Inefficient use of irrigation water, and Degraded Plant Condition - Undesirable plantproductivity and health, and Inefficient Energy Use - Equipment and facilitiesAssociated Practices: 533-Pumping Plant, 449-Irrigation Water Management, 441-Irrigation System, Microirrigation, 443-Irrigation System Surface and Subsurface, 442-Irrigation System, Sprinkler, 328-Conservation Crop Rotation, 634-Waste Transfer, and 590-Nutrient Management.

Before Situation:

Producer estimates seasonal and individual irrigation application flow rate and volumes based on energy costs, system operating pressure, or other means.

After Situation:

Producer is able to access instantaneous rate and cumulative flow volume data from a personal computer or cell phone at any time. The information gained will enable the irrigator to improve irrigation water management, recognize system performance issues before they become critical, and reduce energy use.

Feature Measure: Nominal Diameter of Meter

Scenario Unit: Inch

Scenario Typical Size: 10.00

Scenario Total Cost: $5,572.39

Scenario Cost/Unit: $557.24

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Flow Meter, with electronic Index and telemetry	1451	10 inch Magnetic Irrigation Flow Meter, with electronic index and equipped for telemetry, permanently installed. Includes material and shipping only.	Each	$5,208.23	1	$5,208.23
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	2	$364.16

Practice: 589 - Cross Wind Trap Strips

Scenario: #6 - Annual Strips

Scenario Description:

The implementation of cross wind trap strips with annual grasses, forbs, or legumes established in one or more strips typically perpendicular to the most erosive wind events for one or more of the following purposes: 1) to reduce soil erosion by wind, 2) reduce wind-borne sediment deposition, 3) induce snow deposition to improve soil moisture, 4) protect sensitive crops from wind-borne soil particulate damage, and 5) improve air quality by reducing airborne particulate matter. In this resource setting, cropland fields are unprotected against the erosive forces of wind that cause soil loss, damage to crop seedlings, sediment deposition and/or poor air quality. The scenario is based on the acres of strips established.

Before Situation:

Cropland fields 80 acres in size and larger, have excessive soil disturbance and unsheltered distances that result in excessive wind erosion that damage soil quality as well as reduce air quality. Depending on the time of year, soil condition, and stage of crop growth, wind velocities may cause sandblasting or covering up of newly planted seedlings, increase off-site damage due to soil deposition, or reduce air quality by the generation of airborne particulate matter. The cropping system coupled with intensive tillage provide an environment where wind erosion occurs at rates over tolerable soil and/or sensitive crop limits.

After Situation:

Implementation Requirements will be prepared for the site according to the Cross Wind Trap Strips (589) standard. Appropriate orientation and width of trap strips will be determined using current WEPS (wind erosion prediction system) technology. The planned trap strip system will meet appropriate criteria for the resource concern (i.e. stand erect during the design critical period, be placed upwind for snow accumulation or protection of sensitive crops, meet the minimum height criteria, etc.). Implementation will reduce soil loss to a tolerable level.

Feature Measure: acre of trap strips

Scenario Unit: Acres

Scenario Typical Size: 8.00

Scenario Total Cost: $2,448.66

Scenario Cost/Unit: $306.08

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	8	$119.04
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	8	$53.84
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	4	$89.08
Seeding Operation, No Till/Strip Till Planter	1230	No Till/Strip Till row planters for seeding. Includes all costs for equipment, power unit, and labor.	Acres	$23.11	4	$92.44
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	10	$287.10
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	25	$1,215.00
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$12.66	8	$101.28
Annual Grasses, Legumes or Forbs	2732	A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$61.36	8	$490.88

Practice: 590 - Nutrient Management

Scenario: #8 - Adaptive NM

Scenario Description:

The practice scenario is for the implementation of nutrient management on a small plot, as detailed in outlined in Agronomy Technical Note 7 - Adaptive Nutrient Management. Scenario includes implementing replicated strip trials on a field plot to evaluate, identify and implement various nutrient use efficiency improvement methods for timing, rate, method of application, or source of nutrients.

Before Situation:

The practice will be installed on cropland (small grain rotation or typical corn-soybean rotation) to address water quality degradation, air quality degradation and energy concerns. The scenario applies to non-organic and organic operations.

After Situation:

Installation of this scenario will result in adopting the four R's of nutrient management following the procedures outlined in Agronomy Technical Note 7 - Adaptive Nutrient Management. Implementation involves establishing the replicated plots to evaluate one or more of the 4 R's. The plot will consist of at least 4 replicated plots designed, laid out, managed and evaluated with the assistance of a consultant or extension professional knowledgeable in nutrient management and experimental design and data collection. Results are used to make nutrient application decisions to address water quality degradation issues and nutrient use efficiencies. Yields will be measured and statistically analyzed and summarized following the procedures in Agronomy Technical Note 7. The yields for each plot will be adjusted to the appropriate moisture content.

Feature Measure: <Unknown>

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $2,941.85

Scenario Cost/Unit: $2,941.85

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Aerial Imagery	966	Aerial imagery. RBG (color), infrared or NDVI single image.	Acres	$1.77	1	$1.77
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	25	$717.75
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	15	$1,671.75
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$14.19	2	$28.38
Test, Plant Tissue Test	301	Tissue analysis for crops. Includes materials and shipping only.	Each	$25.27	14	$353.78
Test, Soil Nitrogen Testing	311	Pre-Side Dress/Deep Soil Testing. Includes materials and shipping only.	Each	$12.03	14	$168.42

Practice: 590 - Nutrient Management

Scenario: #288 - Small Scale Basic Nutrient Management

Scenario Description:

This scenario applies to small farms with diversified cropping systems which will improve the current level of management in applying nutrients. Improved level of management will be such to prevent nonpoint source pollution of surface and ground waters. Typical size is less than 1.0 acre. This scenario includes hand-labor as well as equipment.

Before Situation:

Little to no soil or manure testing is being conducted and typically lacks a nutrient budget. Application of fertilizers, including manures and amendments, are conducted based upon traditional fertilizer recommendations from LGU or based on historic use rates. Fields are overwintered with little or no erosion protection often times resulting in sheet, rill, and ephemeral erosion. Nutrients runoff into adjacent streams, tile drains, field surface drains, or other water courses is causing degradation to surface waters or leaching to shallow ground water sources.

After Situation:

Implementation Requirements have been developed to manage nutrients according to the criteria found in Nutrient Management (590) Conservation Practice Standard for either organic or non-organic operations as appropriate. A nutrient budget has been developed for each field or management zone. Nutrients are applied according to the 4 R???s. (Right rate, Right time, Right place and Right source). Records needed to complete the nutrient budget are provided which may include variety of pre-season, in-season, and post-season soil nutrient and plant tissue tests and analysis; compost or manure tests; application timing, method and rate; nutrient sources; and yield data for each field or management zone. Nutrient runoff into adjacent streams is minimized improving water quality and preventing leaching into shallow ground water sources.

Feature Measure: planted area

Scenario Unit: 1,000 Square Foot

Scenario Typical Size: 43.00

Scenario Total Cost: $1,537.61

Scenario Cost/Unit: $35.76

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.61	1	$7.61
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	30	$861.30
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	6	$668.70

Practice: 590 - Nutrient Management

Scenario: #318 - Prescription Nutrient Efficiency

Scenario Description:

The planned Precision Nutrient Efficiency system will meet the current Nutrient Management (590) CPS general and additional criteria. Precision nutrient efficiency system involves the testing or evaluation of crop and/or soil during the growing season to more accurately determine if additional nutrient application(s) are needed. This includes methods or technologies such as PPSN (pre-plant soil nitrate test), PSNT (pre-side dress nitrogen test), LSNT (late spring soil nitrate test), CSNT (corn stalk nitrate test) and chlorophyll meters, and/or spectral analysis may be used to determine if additional nutrients are needed. Nitrification or urease inhibitors (as well as other Enhanced Efficiency Fertilizer technologies recognized by Land Grant Universities) may also be used. Payment for implementation is to defray the costs of additional soil and plant nutrient testing and analysis, in-season crop nutrient testing, equipment, labor, implementation of the NMP and recordkeeping. Typical treatment area is 40 acres.

Before Situation:

This scenario takes a conventional cropping system where either no nutrient management or only a basic level of nutrient management is being practiced and improves it to address air quality (reduce emissions for N fertilizer) and/or minimize agricultural nonpoint source pollution of surface and groundwater. Application(s) of fertilizers, including manures and amendments, are based upon tradition and does not specifically consider the detrimental affects of improper timing or rates of nutrients, nitrous oxide emissions or excess nutrient build-up in the soil. Runoff transports nutrients and sediment to adjacent streams, water courses, tile drains, field surface drains, or other water courses causing degradation to receiving waters. Leaching transports soluble nutrients to shallow ground water sources. There is typically no environmental evaluation of the potential for off-site nutrient movement.

After Situation:

A Precision Nutrient Management Efficiency system will be developed to meet the current Nutrient Management (590) CPS general and additional criteria. When applicable the system will also meet NOP (National Organic Program) regulations, including reducing nitrogen emissions. Implementation of the adopted efficiency system improves the 4R Stewardship installation which will reduce nutrient loss reducing the potential of off-site movement of nutrients. A nutrient budget is developed for each field or management zone annually for the crop rotation or sequence. The Nutrient Management Plan will include current soil test results, nutrient application rates, source, timing, and placement of all nutrients applied, risk assessments and actual crop yields. Record keeping includes documentation of as applied nutrients by field annually plus and State record keeping requirements.

Feature Measure: acres treated

Scenario Unit: Acres

Scenario Typical Size: 40.00

Scenario Total Cost: $2,431.77

Scenario Cost/Unit: $60.79

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.39	1	$116.39
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	2	$50.72
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.61	40	$304.40
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	2	$36.26
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	6	$263.22
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	10	$1,114.50
Materials						
Nitrogen-Urease inhibitor	260	Nitrogen-Urease inhibitor	Acres	$11.13	40	$445.20
Test, Plant Tissue Test	301	Tissue analysis for crops. Includes materials and shipping only.	Each	$25.27	4	$101.08

Practice: 590 - Nutrient Management

Scenario: #324 - Precision Nutrient Application

Scenario Description:

The planned Precision Nutrient Application system will meet the current Nutrient Management (590) CPS General and Additional Criteria. The Application system will include soil sampling methodology for variable rate application and systems. Use of additional nutrient/soil tests including chlorophyll meters, and/or spectral analysis may be used to further refine nutrient applications. Management of nutrients is based on the 4Rs of Nutrient Stewardship & SMART Nutrient Management (apply the right nutrient source at the right rate, time and place) including activities to reduce nutrient loss by Assessment of comprehensive, site-specific conditions within the field. Nutrient management intensity must be sufficient to address site-specific risk for nutrient loss. Payment for implementation is to defray the costs of Precision Nutrient Application system, equipment to implement the practice, implementation of the NMP and recordkeeping. Typical treatment area is 40 acres.

Before Situation:

Currently, a nutrient management system for the farm operation accounting for all know measurable nutrient sources does not exist or does not meet the Nutrient Management (590) CPS requirements for General and Additional Criteria. Management of nutrients is not based on the 4Rs of Nutrient Stewardship & SMART Nutrient Management. An environmental evaluation or risk assessment for the nutrient application area has not completed. Nutrients are subject to loss through surface water runoff, green-house gas emissions, drainage tile, soil erosion, or to ground water from leaching in quantities that degrade soil/water quality and limit use of the intended purpose.

After Situation:

A Precision Nutrient Application system will be developed to meet the current Nutrient Management (590) CPS General and Additional Criteria with nutrient management intensity sufficient to address site-specific risks for nutrient loss. Development and implementation of the NM system is based on site-specific risk assessment of comprehensive, site-specific conditions for the application of nutrients for each nutrient loss pathway that can negatively impact soil, water and air quality with excess nutrient loss. The NM system utilizes the 4Rs of nutrient stewardship and SMART Nutrient Management ??? the right Source, right Method, right Rate, and right Timing to meet both plant productivity and natural resource conservation goals. Utilizing GIS and GPS technologies, nutrients are applied based on soil test results for each grid or management zone using automated variable rate application equipment. Records provided annually include, the current soil test reports, planned nutrient application rates for each grid or management zone (prescription maps) and/or as applied maps, source, timing, and placement of all nutrients applied, actual crop yields and/or generated yield maps.

Feature Measure: acres treated

Scenario Unit: Acres

Scenario Typical Size: 40.00

Scenario Total Cost: $3,271.63

Scenario Cost/Unit: $81.79

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.39	2	$232.78
Equipment Installation						
Fertilizer, precision application	952	Fertilizer application performed by light bar/GPS navigation system. Includes equipment, power unit and labor costs.	Acres	$9.16	40	$366.40
Aerial Imagery	966	Aerial imagery. RBG (color), infrared or NDVI single image.	Acres	$1.77	40	$70.80
Chlorophyll Reader	1125	Applicator and chlorophyll sensor includes labor. No materials	Acres	$12.28	40	$491.20
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	10	$438.70
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	15	$1,671.75

Practice: 590 - Nutrient Management

Scenario: #352 - Nutrient Management - Manure Injection

Scenario Description:

The scenario describes the development and implementation of a Nutrient Management (NM) system which will meet the current Nutrient Management (590) CPS General as well as Additional Criteria and utilizes liquid manure as a nutrient source. Manure nutrients will be injected or placed subsurface. The system provides crop nutrient recommendations which accounts for the removal of nitrogen (N), phosphorus (P), and potassium (K). Management of nutrients is based on the 4Rs of Nutrient Stewardship & SMART Nutrient Management (apply the right nutrient source at the right rate, time and place) including activities to reduce nutrient loss by Assessment of comprehensive, site-specific conditions within the field. Nutrient management intensity must be sufficient to address site-specific risk for nutrient loss. Payment is to defray the costs of implementation of the NM system, injection of manure nutrients and recordkeeping. Typical treatment area is 40 acres.

Before Situation:

Currently, a nutrient management system for the farm operation accounting for all know measurable nutrient sources does not exist or does not meet the Nutrient Management (590) CPS requirements for General and Additional Criteria. Liquid manure is currently surface applied. Management of nutrients is not based on the 4Rs of Nutrient Stewardship & SMART Nutrient Management. An environmental evaluation or risk assessment for the nutrient application area has not completed. Nutrients are subject to loss through surface water runoff, green-house gas emissions, drainage tile, soil erosion, or to ground water from leaching in quantities that degrade soil/water quality and limit use of the intended purpose.

After Situation:

A Nutrient Management (NM) system is developed and implemented to meet the current Nutrient Management (590) CPS for General and Additional Criteria, with nutrient management intensity sufficient to address site-specific risks for nutrient loss. Liquid manure applications are injected below the soil surface at appropriate depth according to the nutrient management system using manure injection equipment to reduce nitrogen loss through surface runoff, leaching and ammonia volatilization. Development and implementation of the NM system is based on site-specific risk assessment of comprehensive, site-specific conditions for the application of nutrients for each nutrient loss pathway that can negatively impact soil, water and air quality with excess nutrient loss. The NM system utilizes the 4Rs of nutrient stewardship and SMART Nutrient Management ??? the right Source, right Method, right Rate, and right Timing to meet both plant productivity and natural resource conservation goals.

Feature Measure: Acres

Scenario Unit: Acres

Scenario Typical Size: 40.00

Scenario Total Cost: $8,840.96

Scenario Cost/Unit: $221.02

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Manure, compost, injection	956	Loading, hauling and injecting manure/compost by ground equipment. Includes equipment, power unit and labor costs.	Gallons	$0.02	400000	$8,000.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	6	$172.26
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	6	$668.70

Practice: 590 - Nutrient Management

Scenario: #364 - Nutrient Management

Scenario Description:

The scenario describes the development and implementation of a Nutrient Management (NM) system which will meet the current Nutrient Management (590) CPS General as well as Additional Criteria and utilizes synthetic fertilizer as well as animal manure as nutrient sources for crop production. The system provides crop nutrient recommendations which accounts for the removal of nitrogen (N), phosphorus (P), and potassium (K). Management of nutrients is based on the 4Rs of Nutrient Stewardship & SMART Nutrient Management (apply the right nutrient source at the right rate, time and place) including activities to reduce nutrient loss by Assessment of comprehensive, site-specific conditions within the field. Nutrient management intensity must be sufficient to address site-specific risk for nutrient loss. Payment is to defray the costs of implementation of the NM system and recordkeeping. Typical treatment area is 40 acres.

Before Situation:

Currently, a nutrient management system for the farm operation accounting for all know measurable nutrient sources does not exist or does not meet the Nutrient Management (590) CPS requirements for General and Additional Criteria. Management of nutrients is not based on the 4Rs of Nutrient Stewardship & SMART Nutrient Management. An environmental evaluation or risk assessment for the nutrient application area has not completed. Nutrients are subject to loss through surface water runoff, green-house gas emissions, drainage tile, soil erosion, or to ground water from leaching in quantities that degrade soil/water quality and limit use of the intended purpose.

After Situation:

A Nutrient Management (NM) system is developed and implemented to meet the current Nutrient Management (590) CPS for General and Additional Criteria, with nutrient management intensity sufficient to address site-specific risks for nutrient loss. Development and implementation of the NM system is based on site-specific risk assessment of comprehensive, site-specific conditions for the application of nutrients for each nutrient loss pathway that can negatively impact soil, water and air quality with excess nutrient loss. The NM system utilizes the 4Rs of nutrient stewardship and SMART Nutrient Management ??? the right Source, right Method, right Rate, and right Timing to meet both plant productivity and natural resource conservation goals.

Feature Measure: Ac.

Scenario Unit: Acres

Scenario Typical Size: 40.00

Scenario Total Cost: $1,542.36

Scenario Cost/Unit: $38.56

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.61	20	$152.20
Manure, compost, application	955	Loading, hauling and spreading manure/compost by ground equipment. Includes equipment, power unit and labor costs.	Hours	$137.30	4	$549.20
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	6	$172.26
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	6	$668.70

Practice: 590 - Nutrient Management

Scenario: #365 - Nutrient Management - Non-Organic

Scenario Description:

The scenario describes the development and implementation of a Nutrient Management (NM) system which will meet the current Nutrient Management (590) CPS General as well as Specific Criteria and utilizes synthetic fertilizers as sole nutrient source for crop production. The system provides crop nutrient recommendations which accounts for the removal of nitrogen (N), phosphorus (P), and potassium (K). Management of nutrients is based on the 4Rs of Nutrient Stewardship & SMART Nutrient Management (apply the right nutrient source at the right rate, time and place) including activities to reduce nutrient loss by Assessment of comprehensive, site-specific conditions within the field. Nutrient management intensity must be sufficient to address site-specific risk for nutrient loss. Payment is to defray the costs of implementation of the NM system and recordkeeping. Typical treatment area is 40 acres.

Before Situation:

Currently, a nutrient management system for the farm operation accounting for all know measurable nutrient sources does not exist or does not meet the Nutrient Management (590) CPS requirements for General and Additional Criteria. Management of nutrients is not based on the 4Rs of Nutrient Stewardship & SMART Nutrient Management. An environmental evaluation or risk assessment for the nutrient application area has not completed. Nutrients are subject to loss through surface water runoff, green-house gas emissions, drainage tile, soil erosion, or to ground water from leaching in quantities that degrade soil/water quality and limit use of the intended purpose.

After Situation:

A Nutrient Management (NM) system is developed and implemented to meet the current Nutrient Management (590) CPS for General and Additional Criteria, with nutrient management intensity sufficient to address site-specific risks for nutrient loss. Development and implementation of the NM system is based on site-specific risk assessment of comprehensive, site-specific conditions for the application of nutrients for each nutrient loss pathway that can negatively impact soil, water and air quality with excess nutrient loss. The NM system utilizes the 4Rs of nutrient stewardship and SMART Nutrient Management ??? the right Source, right Method, right Rate, and right Timing to meet both plant productivity and natural resource conservation goals.

Feature Measure: Ac.

Scenario Unit: Acres

Scenario Typical Size: 40.00

Scenario Total Cost: $1,145.36

Scenario Cost/Unit: $28.63

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.61	40	$304.40
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	6	$172.26
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	6	$668.70

Practice: 590 - Nutrient Management

Scenario: #366 - Nutrient Management

Scenario Description:

The scenario describes the development and implementation of a Nutrient Management (NM) system which will meet the current Nutrient Management (590) CPS General as well as Additional Criteria and utilizes synthetic fertilizer as well as animal manure as nutrient sources for crop production. The system provides crop nutrient recommendations which accounts for the removal of nitrogen (N), phosphorus (P), and potassium (K). Management of nutrients is based on the 4Rs of Nutrient Stewardship & SMART Nutrient Management (apply the right nutrient source at the right rate, time and place) including activities to reduce nutrient loss by Assessment of comprehensive, site-specific conditions within the field. Nutrient management intensity must be sufficient to address site-specific risk for nutrient loss. Payment is to defray the costs of implementation of the NM system and recordkeeping. Typical treatment area is 40 acres.

Before Situation:

Currently, a nutrient management system for the farm operation accounting for all know measurable nutrient sources does not exist or does not meet the Nutrient Management (590) CPS requirements for General and Additional Criteria. Management of nutrients is not based on the 4Rs of Nutrient Stewardship & SMART Nutrient Management. An environmental evaluation or risk assessment for the nutrient application area has not completed. Nutrients are subject to loss through surface water runoff, green-house gas emissions, drainage tile, soil erosion, or to ground water from leaching in quantities that degrade soil/water quality and limit use of the intended purpose.

After Situation:

A Nutrient Management (NM) system is developed and implemented to meet the current Nutrient Management (590) CPS for General and Additional Criteria, with nutrient management intensity sufficient to address site-specific risks for nutrient loss. Development and implementation of the NM system is based on site-specific risk assessment of comprehensive, site-specific conditions for the application of nutrients for each nutrient loss pathway that can negatively impact soil, water and air quality with excess nutrient loss. The NM system utilizes the 4Rs of nutrient stewardship and SMART Nutrient Management ??? the right Source, right Method, right Rate, and right Timing to meet both plant productivity and natural resource conservation goals.

Feature Measure: Ac.

Scenario Unit: Acres

Scenario Typical Size: 40.00

Scenario Total Cost: $1,542.36

Scenario Cost/Unit: $38.56

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.61	20	$152.20
Manure, compost, application	955	Loading, hauling and spreading manure/compost by ground equipment. Includes equipment, power unit and labor costs.	Hours	$137.30	4	$549.20
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	6	$172.26
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	6	$668.70

Practice: 590 - Nutrient Management

Scenario: #367 - Nutrient Management - Non-Organic

Scenario Description:

The scenario describes the development and implementation of a Nutrient Management (NM) system which will meet the current Nutrient Management (590) CPS General as well as Specific Criteria and utilizes synthetic fertilizers as sole nutrient source for crop production. The system provides crop nutrient recommendations which accounts for the removal of nitrogen (N), phosphorus (P), and potassium (K). Management of nutrients is based on the 4Rs of Nutrient Stewardship & SMART Nutrient Management (apply the right nutrient source at the right rate, time and place) including activities to reduce nutrient loss by Assessment of comprehensive, site-specific conditions within the field. Nutrient management intensity must be sufficient to address site-specific risk for nutrient loss. Payment is to defray the costs of implementation of the NM system and recordkeeping. Typical treatment area is 40 acres.

Before Situation:

Currently, a nutrient management system for the farm operation accounting for all know measurable nutrient sources does not exist or does not meet the Nutrient Management (590) CPS requirements for General and Additional Criteria. Management of nutrients is not based on the 4Rs of Nutrient Stewardship & SMART Nutrient Management. An environmental evaluation or risk assessment for the nutrient application area has not completed. Nutrients are subject to loss through surface water runoff, green-house gas emissions, drainage tile, soil erosion, or to ground water from leaching in quantities that degrade soil/water quality and limit use of the intended purpose.

After Situation:

A Nutrient Management (NM) system is developed and implemented to meet the current Nutrient Management (590) CPS for General and Additional Criteria, with nutrient management intensity sufficient to address site-specific risks for nutrient loss. Development and implementation of the NM system is based on site-specific risk assessment of comprehensive, site-specific conditions for the application of nutrients for each nutrient loss pathway that can negatively impact soil, water and air quality with excess nutrient loss. The NM system utilizes the 4Rs of nutrient stewardship and SMART Nutrient Management ??? the right Source, right Method, right Rate, and right Timing to meet both plant productivity and natural resource conservation goals.

Feature Measure: Ac.

Scenario Unit: Acres

Scenario Typical Size: 40.00

Scenario Total Cost: $1,145.36

Scenario Cost/Unit: $28.63

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.61	40	$304.40
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	6	$172.26
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	6	$668.70

Practice: 590 - Nutrient Management

Scenario: #368 - Nutrient Management - Manure Incorporation

Scenario Description:

The scenario describes the development and implementation of a Nutrient Management Plan (NMP) which will meet the current Nutrient Management (590) CPS General as well Additional Criteria and utilizes manure as a nutrient source for crop production. Manure nutrient sources will be incorporated into the soil after application. This scenario is applicable for all manure nutrient sources (manure, compost and other organic sources of nutrients). Management of nutrients is based on the 4Rs of Nutrient Stewardship & SMART Nutrient Management (apply the right nutrient source at the right rate, time and place) including activities to reduce nutrient loss by Assessment of comprehensive, site-specific conditions within the field. Nutrient management intensity must be sufficient to address site-specific risk for nutrient loss. Payment is to defray the costs of implementation of the NMP and recordkeeping. Typical treatment area is 40 acres.

Before Situation:

Currently, a nutrient management plan for the farm operation accounting for all know measurable nutrient sources does not exist or does not meet the Nutrient Management (590) CPS requirements for General and Additional Criteria. Management of nutrients is not based on the 4Rs of Nutrient Stewardship & SMART Nutrient Management. An environmental evaluation or risk assessment for the nutrient application area has not completed. Currently, manure applications are not incorporated into the soil. Nutrients are subject to loss through surface water runoff, green-house gas emissions, drainage tile, soil erosion, or to ground water from leaching in quantities that degrade water quality and limit use of the intended purpose. Soil quality may be degraded by excess or inadequate nutrients.

After Situation:

A Nutrient Management Plan (NMP) is developed to meet the current Nutrient Management (590) CPS for General and Additional Criteria with nutrient management intensity sufficient to address site-specific risks for nutrient loss. Development and implementation of the NMP is based on site-specific risk assessment of comprehensive, site-specific conditions for the application of nutrients for each nutrient loss pathway that can negatively impact soil, water and air quality with excess nutrient loss. Manure applications are incorporated into the soil. The NMP utilizes the 4Rs of nutrient stewardship and SMART Nutrient Management ??? the right Source, right Method, right Rate, and right Timing to meet both plant productivity and natural resource conservation goals.

Feature Measure: Ac.

Scenario Unit: Acres

Scenario Typical Size: 40.00

Scenario Total Cost: $2,294.56

Scenario Cost/Unit: $57.36

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acres	$22.61	40	$904.40
Manure, compost, application	955	Loading, hauling and spreading manure/compost by ground equipment. Includes equipment, power unit and labor costs.	Hours	$137.30	4	$549.20
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	6	$172.26
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	6	$668.70

Practice: 592 - Feed Management

Scenario: #1 - Dairy operation- Large or more than 200 AU

Scenario Description:

Feed ration management on a dairy operation that does not have access to enough acres to spread all of its manure nutrients at an agronomic rate. The resource concerns are water quality degradation, excessive manure nutrients particularly phosphorus and nitrogen. The goal of the practice is to reduce the amount of nutrients in the raw manure so that it is easier for 'landlocked' farmers to apply the manure at agronomic rates, thereby reducing or eliminating water quality degradation concerns.

Associated practices: Nutrient management (590), Prescribed Grazing (528), Forage and Biomass Planting (512), Forage Harvest Management (511)

Before Situation:

Producer is feeding a higher level of protein (17%) and phosphorus (0.45%) than is needed to meet National Research Council (NRC) recommendations for a herd of this type and at this stage of production. The operation does not have all of the available acres that it needs to use the nutrients in the manure when spread at agronomic rates causing over application of nutrients on land affecting soil quality, which may lead to water quality degradation.

After Situation:

The scenario assumes the operation milks 500 holstein cows at average weight of 1,400 pounds, or 700 animal units. A baseline analysis of manure, feed, and milk will be completed to determine the current nutrient inputs and outputs. The Producer will reduce feed protein and phosphorus levels to that of NRC recommendations for a herd of this type and at this stage of production (12% protein and 0.35% phosphorus). Producer will explore alternative feedstuffs and alternative feeding strategies to bring manure nitrogen and phosphorus levels down without hurting production of the animals or profitability of the operation. Alternative feeding strategies can include things like grouping animals per similar age or stage of production, or feeding based on individual rolling average production.

Feature Measure: Number of 1000 pound animal unit

Scenario Unit: Animal Unit

Scenario Typical Size: 700.00

Scenario Total Cost: $4,379.86

Scenario Cost/Unit: $6.26

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	10	$438.70
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	20	$574.20
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	24	$2,674.80
Materials						
Test, Manure Analysis	306	Moisture, Total N, P, K. Includes materials and shipping only.	Each	$48.54	4	$194.16
Test, Feed Analysis	1989	Representative sample of feed. Includes materials and shipping only.	Each	$30.81	16	$492.96
Test, MUN Testing	1990	Testing nitrogen level in milk as a measure of nitrogen that will be exhibited in manure. Includes materials and shipping only.	Each	$0.42	12	$5.04

Practice: 592 - Feed Management

Scenario: #2 - Dairy operation - Small or less than 200 AU

Scenario Description:

Feed ration management on a small dairy operation that does not have access to enough acres to spread all of its manure nutrients at an agronomic rate. The resource concerns are water quality degradation, excessive manure nutrients particularly phosphorus and nitrogen. The goal of the practice is to reduce the amount of nutrients in the raw manure so that it is easier for 'landlocked' farmers to apply the manure at agronomic rates, thereby reducing or eliminating water quality degradation concerns.

Associated practices: Nutrient management (590), Prescribed Grazing (528), Forage and Biomass Planting (512), Forage Harvest Management (511)

Before Situation:

Producer is feeding a higher level of protein (17%) and phosphorus (0.45%) than is needed to meet National Research Council (NRC) recommendations for a herd of this type and at this stage of production. The operation does not have all of the available acres that it needs to use the nutrients in the manure when spread at agronomic rates causing over application of nutrients on land affecting soil quality, which may lead to water quality degradation.

After Situation:

The scenario assumes the operation milks 50 Jersey and Guernsey cows at average weight of 1,000 pounds, or 50 animal units. A baseline analysis of manure, feed, and milk will be completed to determine the current nutrient inputs and outputs. The Producer will reduce feed protein and phosphorus levels to that of NRC recommendations for a herd of this type and at this stage of production (12% protein and 0.35% phosphorus). The producer will also implement pasturing of his herd part to the time where the animals will obtain some of their diet by grazing pastures as well as explore alternative feedstuffs and alternative feeding strategies to bring manure nitrogen and phosphorus levels down without hurting production of the animals or profitability of the operation.

Feature Measure: Number of 1000 pound animal unit

Scenario Unit: Animal Unit

Scenario Typical Size: 50.00

Scenario Total Cost: $2,566.30

Scenario Cost/Unit: $51.33

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	10	$438.70
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	12	$344.52
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	12	$1,337.40
Materials						
Test, Manure Analysis	306	Moisture, Total N, P, K. Includes materials and shipping only.	Each	$48.54	4	$194.16
Test, Feed Analysis	1989	Representative sample of feed. Includes materials and shipping only.	Each	$30.81	8	$246.48
Test, MUN Testing	1990	Testing nitrogen level in milk as a measure of nitrogen that will be exhibited in manure. Includes materials and shipping only.	Each	$0.42	12	$5.04

Practice: 592 - Feed Management

Scenario: #3 - Livestock - non-dairy

Scenario Description:

This example is feed ration management on a swine finishing operation that does not have access to enough acres to spread all of the nutrients in the manure, at agronomic rates. The resource concernss are water quality, and excessive manure nutrients, particularly nitrogen and phosphorus. The goal of the practice is to reduce these excess nutrients to a point where they can be fully utilized at agronomic rates on the existing land base, thereby reducing or eliminating water quality degredation concerns. Associated Practices: Nutrient management (590)

Before Situation:

The producer is feeding a single diet with a higher level of protein (16%) and phosphorus (0.65%) than is needed to meet National Research Council (NRC) recommendations for animals of this type and at this stage of production.

After Situation:

This scenario's operation currently houses 2800 finishing hogs with an average weight of 154 pounds, or 430 animal units ((2800 hogs * 154 lbs/hog/1000 lbs/AU154)) = 430 AU). The farm typically gows out 2.5 turns per year. A baseline analysis of manure and feed will be completed to determine the current nutrient inputs and outputs. The producer will reduce feed protein and phosphorus levels to that of NRC recommendations for animals of this type and at this stage of production. Producer will consider alternative feedstuffs, phase feeding, split-sex feeding and other scenarios to achieve the objective. Proper feed management removes excess nutrients from the manure, making the manure easier for the producer to properly manage within his/her land constraints. The improved manaure management prevents surface and groundwater degredation from excess nitrogen and phosphorus.

Feature Measure: Number of 1000 pound animal unit

Scenario Unit: Animal Unit

Scenario Typical Size: 1,075.00

Scenario Total Cost: $2,410.92

Scenario Cost/Unit: $2.24

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	12	$526.44
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	12	$1,337.40
Materials						
Test, Manure Analysis	306	Moisture, Total N, P, K. Includes materials and shipping only.	Each	$48.54	4	$194.16
Test, Feed Analysis	1989	Representative sample of feed. Includes materials and shipping only.	Each	$30.81	4	$123.24

Practice: 592 - Feed Management

Scenario: #21 - Animal Group

Scenario Description:

Feed ration management on an animal operation that does not have access to enough acres to spread all of its manure nutrients at an agronomic rate. The resource concerns are water quality degradation, excessive manure nutrients, particularly nitrogen and phosphorus. The goal of the practice is to reduce the amount of nutrients in the raw manure so that it is easier for ???landlocked??? farmers to apply the manure at agronomic rates, thereby reducing or eliminating water quality degradation concerns. Associated practices: Nutrient Management (590), Prescribed Grazing (528), Forage Harvest Management (511).

Before Situation:

Producer is feeding a higher level of protein and/or phosphorus than is needed to meet National Research Council (NRC) recommendations for a group of animals of this type and at this stage of production. The operation does not have all of the available acres that it needs to use the nutrients in the manure when spread at agronomic rates causing over application of nutrients on land affecting soil quality, which may lead to water quality degradation.

After Situation:

The scenario assumes that a specific group of animals is being evaluated. A baseline analysis of 4 samples each with 4 quarterly reports of manure, and feed will be completed to determine the current inputs and outputs. The producer will reduce feed protein and phosphorus levels to that of NRC recommendations for a group of animals of this type and at this stage of production. The producer will explore alternative feedstuffs and alternative feeding strategies to bring manure nitrogen and/or phosphorus levels down without hurting production of the animals or profitability of the operation. Alternative feeding strategies can include such things as grouping animals by similar age, sex, or stage of production, feeding based on individual rolling average production, or feeding ???homegrown??? or local feedstuffs.

Feature Measure: Group

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $4,187.64

Scenario Cost/Unit: $4,187.64

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	24	$689.04
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	20	$2,229.00
Materials						
Test, Manure Analysis	306	Moisture, Total N, P, K. Includes materials and shipping only.	Each	$48.54	16	$776.64
Test, Feed Analysis	1989	Representative sample of feed. Includes materials and shipping only.	Each	$30.81	16	$492.96

Practice: 592 - Feed Management

Scenario: #37 - Feed Additive

Scenario Description:

Feed ration management on an animal operation by inclusion of a feed additive. The resource concerns may be water quality degradation (pathogens, soluble nutrients), air quality (odors, green house gas). The goal of the practice is to add an approved feed additive that has been proven to reduce pathogens, or tie up soluble nutrients, or improve air quality by reducing odors, ammonia, or green house gases to the animal diet. For this scenario, zeolite will be added to beef and dairy rations to reduce ammonia emissions. Associated practices: Nutrient Management (590).

Before Situation:

Producer is feeding a balanced diet to his animals. He knows that the diet, however is leading to resource concerns by soluble nutrients or pathogens entering the surface water from his operation, or that odors, NOx, or Methane are affecting air quality. For this scenario, the producer knows that nitrogen loss via ammonia volatilization from manure is affecting air quality and that adding zeolite to the ration will decrease this effect and improve air quality for his animals.

After Situation:

The scenario assumes that a specific group of animals is being evaluated for a resource concern, and that a proven feed additive can have an effect on that concern. For this particular scenario, a zeolite is added to a beef or dairy ration at a rate of 2% of the daily ration. The zeolite will absorb ammonia and other compounds, resulting in lower nitrogen excretion and thus lower ammonia emissions from the manure and result in improved air quality. Assume that one hour of general labor will be needed per year per animal unit to load/unload zeolite into feed mixing equipment. Assume that the zeolite is added based on a 2% inclusion rate of the dry matter ration of 25 pounds/day/animal unit or the amount of zeolite needed is 0.5 pounds/day/animal unit or about 0.1 tons/year/animal unit.

Feature Measure: Per Animal unit, per year

Scenario Unit: Animal Unit

Scenario Typical Size: 1.00

Scenario Total Cost: $67.41

Scenario Cost/Unit: $67.41

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	1	$28.71
Materials						
Zeolite, Bulk	2683	Zeolite applied as a pen surface amendment or used as a feed ingredient. Zeolite is added to feed as a nutrition-based strategies or applied to pen surface as an ammonia abatement measures in livestock production, means of reducing ammonia emissions from concentrated animal feeding operations.	Ton	$387.00	0.1	$38.70

Practice: 595 - Pest Management Conservation System

Scenario: #189 - Water Quality Pesticide Mitigation > 30 Point AND/OR Beneficial Insect Pesticide Mitigation - Small Farm

Scenario Description:

The minimum amount of planned IPM mitigation techniques needed to reduce water quality pesticide-related resource concerns is > 30 mitigation index score. An IPM plan will be developed in accordance with this standard and the CPS 595 Implementation Requirement will document how specific pesticide hazards will be prevented or mitigated AND/OR impacts to wildlife-beneficial insects including pollinators.

Before Situation:

Before practice conditions vary widely. Conditions range from the client is not using many pest suppression techniques (pesticides, tillage for weed control, burning, etc.) to the client is using many different pest suppression techniques for many different pests, but in all cases at least one planned pest suppression technique has risk to an identified resource concern (e.g. Water Quality - Impacts to Human Drinking Water AND/OR Wildlife-beneficial insects including pollinators).

After Situation:

An IPM system with planned. Mitigation techniques (>30 points) have been implemented to meet the minimum criteria for the identified resource concerns (i.e. Water Quality - Impacts to Human Drinking Water or Fish) AND 10 points of mitigation for Wildlife (beneficial insects including pollinators) with either risk prevention (i.e. planned pesticides have no risk to the identified resource concern) or risk mitigation (i.e. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 AND Agronomy Technical Note 9).

Feature Measure: Small Farm, typically <= 5 acs

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $2,103.35

Scenario Cost/Unit: $2,103.35

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	20	$877.40
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	11	$1,225.95

Practice: 595 - Pest Management Conservation System

Scenario: #190 - Water Quality Pesticide Mitigation = 30 Point AND/OR Beneficial Insect Pesticide Mitigation - Small Farm

Scenario Description:

The minimum amount of planned IPM mitigation techniques needed to reduce water quality pesticide-related resource concerns is = 30 mitigation index score. An IPM plan will be developed in accordance with this standard and the CPS 595 Implementation Requirement will document how specific pesticide hazards will be prevented or mitigated AND/OR impacts to wildlife-beneficial insects including pollinators.

Before Situation:

Before practice conditions vary widely. Conditions range from the client is not using many pest suppression techniques (pesticides, tillage for weed control, burning, etc.) to the client is using many different pest suppression techniques for many different pests, but in all cases at least one planned pest suppression technique has risk to an identified resource concern (e.g. Water Quality - Impacts to Human Drinking Water AND/OR Wildlife-beneficial insects including pollinators).

After Situation:

An IPM system with planned. Mitigation techniques (=30 points) have been implemented to meet the minimum criteria for the identified resource concerns (i.e. Water Quality - Impacts to Human Drinking Water or Fish) AND/OR 10 points of mitigation for Wildlife (beneficial insects including pollinators) with either risk prevention (i.e. planned pesticides have no risk to the identified resource concern) or risk mitigation (i.e. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 AND/OR Agronomy Technical Note 9).

Feature Measure: Small Farm, typically <= 5 acres

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $1,282.88

Scenario Cost/Unit: $1,282.88

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	14	$614.18
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	6	$668.70

Practice: 595 - Pest Management Conservation System

Scenario: #191 - Water Quality Pesticide Mitigation > 30 Point AND/OR Beneficial Insect Pesticide Mitigation

Scenario Description:

The minimum amount of planned IPM mitigation techniques needed to reduce water quality pesticide-related resource concerns is > 30 mitigation index score. An IPM plan will be developed in accordance with this standard and the CPS 595 Implementation Requirement will document how specific pesticide hazards will be prevented or mitigated AND/OR impacts to wildlife-beneficial insects including pollinators.

Before Situation:

Before practice conditions vary widely. Conditions range from the client is not using many pest suppression techniques (pesticides, tillage for weed control, burning, etc.) to the client is using many different pest suppression techniques for many different pests, but in all cases at least one planned pest suppression technique has risk to an identified resource concern (e.g. Water Quality - Impacts to Human Drinking Water AND/OR Wildlife-beneficial insects including pollinators).

After Situation:

An IPM system with planned. Mitigation techniques (>30 points) have been implemented to meet the minimum criteria for the identified resource concerns (i.e. Water Quality - Impacts to Human Drinking Water or Fish) AND/OR 10 points of mitigation for Wildlife (beneficial insects including pollinators) with either risk prevention (i.e. planned pesticides have no risk to the identified resource concern) or risk mitigation (i.e. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 AND/OR Agronomy Technical Note 9).

Feature Measure: Acres of Management Applied

Scenario Unit: Acres

Scenario Typical Size: 40.00

Scenario Total Cost: $2,887.05

Scenario Cost/Unit: $72.18

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	15	$658.05
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	20	$2,229.00

Practice: 595 - Pest Management Conservation System

Scenario: #192 - Water Quality Pesticide Mitigation = 30 Point AND/OR Beneficial Insect Pesticide Mitigation

Scenario Description:

The minimum amount of planned IPM mitigation techniques needed to reduce water quality pesticide-related resource concerns is = 30 mitigation index score. An IPM plan will be developed in accordance with this standard and the CPS 595 Implementation Requirement will document how specific pesticide hazards will be prevented or mitigated AND/OR impacts to wildlife-beneficial insects including pollinators.

Before Situation:

Before practice conditions vary widely. Conditions range from the client is not using many pest suppression techniques (pesticides, tillage for weed control, burning, etc.) to the client is using many different pest suppression techniques for many different pests, but in all cases at least one planned pest suppression technique has risk to an identified resource concern (e.g. Water Quality - Impacts to Human Drinking Water AND/OR Wildlife-beneficial insects including pollinators).

After Situation:

An IPM system with planned. Mitigation techniques (=30 points) have been implemented to meet the minimum criteria for the identified resource concerns (i.e. Water Quality - Impacts to Human Drinking Water or Fish) AND/OR 10 points of mitigation for Wildlife (beneficial insects including pollinators) with either risk prevention (i.e. planned pesticides have no risk to the identified resource concern) or risk mitigation (i.e. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 AND Agronomy Technical Note 9).

Feature Measure: Acres of Management Applied

Scenario Unit: Acres

Scenario Typical Size: 40.00

Scenario Total Cost: $1,644.49

Scenario Cost/Unit: $41.11

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	7	$307.09
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	12	$1,337.40

Practice: 595 - Pest Management Conservation System

Scenario: #233 - Plant Health PAMS (acs) Low Labor and Materials

Scenario Description:
PAMS activities with low labor and material costs will be implemented on a large scale crop production area.

Before Situation:
Before practice conditions vary widely. Conditions range from the client is not using any PAMS techniques to the client is using many different PAMS techniques for many different pests. In all cases at least one planned PAMS technique has risk to an identified resource concern (Plant Pest Pressure).

After Situation:
Planned Prevention (resistant cultivar selection, etc.), Avoidance (IWM for disease avoidance, change in rotation to avoid problem spots, etc.), and Monitoring (Degree day monitoring, field scouting, etc.) activities have been implemented to help meet the minimum criteria for the identified resource concerns (i.e. Plant Pest Pressure).

Feature Measure: Acres of Management Applied

Scenario Unit: Acres

Scenario Typical Size: 40.00

Scenario Total Cost: $992.91

Scenario Cost/Unit: $24.82

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.39	1	$116.39
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	2	$87.74
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	2	$222.90
Materials						
Miscellaneous, containers, traps, etc.	298	Pheromone Traps, Culture container with lid. Includes materials and shipping only.	Each	$4.90	10	$49.00
Weather Station, Basic	314	Basic Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, and temperature to a home weather console. Includes materials only.	Each	$287.20	1	$287.20

Practice: 595 - Pest Management Conservation System

Scenario: #234 - Plant Health PAMS (acs) Low labor only

Scenario Description:
PAMS activities with low labor costs will be implemented on a large scale crop production area.

Before Situation:
Before practice conditions vary widely. Conditions range from the client is not using any PAMS techniques to the client is using many different PAMS techniques for many different pests. In all cases at least one planned PAMS technique has risk to an identified resource concern (Plant Pest Pressure).

After Situation:
Planned Prevention (resistant cultivar selection, pest habitat removal, etc.), Avoidance (IWM for disease avoidance, change in rotation to avoid problem spots, etc.), and Monitoring (field scouting, etc.) activities have been implemented to help meet the minimum criteria for the identified resource concerns (i.e. Plant Pest Pressure).

Feature Measure: Acres of management applied

Scenario Unit: Acres

Scenario Typical Size: 40.00

Scenario Total Cost: $656.71

Scenario Cost/Unit: $16.42

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.39	1	$116.39
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	2	$87.74
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	2	$222.90

Practice: 595 - Pest Management Conservation System

Scenario: #235 - Pest Management Precision Ag

Scenario Description:

This scenario takes a conventional cropping system where either no pest management or only a basic level of pest management is being practiced and improves it to address air quality and/or minimize agricultural nonpoint sources pollution of surface and groundwater. The planned Pest Management system will meet the current Pest Management Conservation System (595) CPS general and additional criteria. Precision pest management system includes such items as pest monitoring, targeted applications, eliminates overlap, tissue testing, specialized nozzles etc. to further refine pesticide applications. Payment for implementation is to defray the costs of tissue testing, additional testing and analysis, equipment implementation of the PMCS and recordkeeping. Typical treatment area is 40 acres.

Before Situation:

Conventional pest management programs involve little or no monitoring and testing. Application of pesticides are completed annually based upon product salesmen recommendations that do not specifically consider the detrimental affects of inexact application methods. Fields are overwintered with little or no erosion protection often resulting in sheet, rill and ephemeral erosion. Runoff flows into adjacent streams, water courses, tile drains, field surface drains or other water courses causing degradation to receiving waters or leaching of pesticides to shallow ground water sources. There is typically no environmental evaluation of the potential for off-site movement. Soil health may also be detrimentally affected.

After Situation:

A precision pest management system will be developed to meet the current Pest Management Conservation System (595) CPS general and additional criteria, when applicable the system will also meet NOP regulations. Development and implementation of a PMCS will benefit plant productivity while reducing potential of off-site movement of pesticides. PMCS may include practices such as use of spot applications, proper timing of applications, more appropriate formulations etc. Additional monitoring and tissue testing may also be used to further refine pesticide applications. Smart sprayer and advanced nozzle technology may also be employed. Records will be provided annually of the current monitoring, test analysis, application rates, formulations for each field including crop yields.

Feature Measure: Acres of management applied

Scenario Unit: Acres

Scenario Typical Size: 40.00

Scenario Total Cost: $2,617.93

Scenario Cost/Unit: $65.45

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	4	$101.44
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	8	$145.04
Aerial Imagery	966	Aerial imagery. RBG (color), infrared or NDVI single image.	Acres	$1.77	40	$70.80
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	8	$350.96
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	12	$344.52
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	14	$1,560.30
Materials						
Miscellaneous, containers, traps, etc.	298	Pheromone Traps, Culture container with lid. Includes materials and shipping only.	Each	$4.90	4	$19.60
Test, Plant Tissue Test	301	Tissue analysis for crops. Includes materials and shipping only.	Each	$25.27	1	$25.27

Practice: 595 - Pest Management Conservation System

Scenario: #236 - Plant Health PAMS activities (Small Farm - each) labor, materials and mitigation.

Scenario Description:
PAMS activities with labor and material costs plus mitigation will be implemented on a small scale crop production area.

Before Situation:
Before practice conditions vary widely. Conditions range from the client is not using any PAMS techniques to the client is using many different PAMS techniques for many different pests. In all cases at least one planned PAMS technique has risk to an identified resource concern (Plant Pest Pressure). Mitigation over 30 points.

After Situation:
Planned Prevention (Netting to exclude insect or birds, resistant cultivar selection, etc.), Avoidance (IWM for disease avoidance, change in rotation to avoid problem spots, etc.), and Monitoring (Degree day monitoring, field scouting, etc.) activities have been implemented to help meet the minimum criteria for the identified resource concerns (i.e. Plant Pest Pressure). Mitigation over 30 points.

Feature Measure: Small farm, typically = 5Ac

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $7,211.91

Scenario Cost/Unit: $7,211.91

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.39	1	$116.39
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	27	$1,184.49
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	17	$1,894.65
Materials						
Miscellaneous, containers, traps, etc.	298	Pheromone Traps, Culture container with lid. Includes materials and shipping only.	Each	$4.90	3	$14.70
Weather Station, Basic	314	Basic Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, and temperature to a home weather console. Includes materials only.	Each	$287.20	1	$287.20
Netting, Crop Protection, Large Mesh	2762	Synthetic netting, large mesh to exclude birds and small animals. Approximately 6 to 7 inch mesh. Includes materials and shipping only.	Square Feet	$0.04	87120	$3,484.80

Practice: 595 - Pest Management Conservation System

Scenario: #237 - Plant Health PAMS (acs) High labor only (intensive scouting etc.)

Scenario Description:
Plant Health PAMS (acs) High labor only (intensive scouting etc.)

Before Situation:
Before practice conditions vary widely. Conditions range from the client is not using any PAMS techniques to the client is using many different PAMS techniques for many different pests. In all cases at least one planned PAMS technique has risk to an identified resource concern (Plant Pest Pressure).

After Situation:
Planned Prevention (resistant cultivar selection, pest habitat removal, etc.), Avoidance (IWM for disease avoidance, change in rotation to avoid problem spots, etc.), and Monitoring (field scouting, etc.) activities have been implemented to help meet the minimum criteria for the identified resource concerns (i.e. Plant Pest Pressure).

Feature Measure: Acres of Management Applied

Scenario Unit: Acres

Scenario Typical Size: 40.00

Scenario Total Cost: $2,014.45

Scenario Cost/Unit: $50.36

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.39	1	$116.39
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	2	$87.74
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	32	$918.72
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	8	$891.60

Practice: 595 - Pest Management Conservation System

Scenario: #238 - Plant health PAMS (Small Farm - each) labor and mitigation.

Scenario Description:
PAMS activities with labor costs will be implemented plus mitigation on a small scale crop production area.

Before Situation:
Before practice conditions vary widely. Conditions range from the client is not using any PAMS techniques to the client is using many different PAMS techniques for many different pests. In all cases at least one planned PAMS technique has risk to an identified resource concern (Plant Pest Pressure). Mitigation up to 30 points.

After Situation:
Planned Prevention (resistant cultivar selection, pest habitat removal, etc.), Avoidance (IWM for disease avoidance, change in rotation to avoid problem spots, etc.), and Monitoring (field scouting, etc.) activities have been implemented to help meet the minimum criteria for the identified resource concerns (i.e. Plant Pest Pressure). Mitigation up to 30 points.

Feature Measure: Small farm, typically = 5Ac

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $1,963.30

Scenario Cost/Unit: $1,963.30

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.39	1	$116.39
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	14	$614.18
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	9	$1,003.05

Practice: 595 - Pest Management Conservation System

Scenario: #239 - Plant Health PAMS (acs) High Labor, materials and mitigation.

Scenario Description:
PAMS activities with high labor and material costs (weather station, netting, field sanitation, mating disruption) plus mitigation will be implemented on a large scale crop production area.

Before Situation:
Before practice conditions vary widely. Conditions range from the client is not using any PAMS techniques to the client is using many different PAMS techniques for many different pests. In all cases at least one planned PAMS technique has risk to an identified resource concern (Plant Pest Pressure). Mitigation over 30 points.

After Situation:
Planned Prevention (Netting to exclude insect or birds, resistant cultivar selection, etc.), Avoidance (IWM for disease avoidance, change in rotation to avoid problem spots, etc.), and Monitoring (Degree day monitoring, field scouting, etc.) activities have been implemented to help meet the minimum criteria for the identified resource concerns (i.e. Plant Pest Pressure). Mitigation over 30 points.

Feature Measure: Acres of management applied

Scenario Unit: Acres

Scenario Typical Size: 40.00

Scenario Total Cost: $21,232.28

Scenario Cost/Unit: $530.81

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.39	1	$116.39
Equipment Installation						
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$75.12	150	$11,268.00
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	15	$658.05
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	150	$4,306.50
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	30	$1,458.00
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	22	$2,451.90
Materials						
Weather Station, Advanced	2550	Advance Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, temperature, and solar radiation from a solar powered self-standing tripod to an advance weather recording console. Used for both 449 advance irrigation water management and for Activity 202 water quality monitoring .	Each	$973.44	1	$973.44

Practice: 595 - Pest Management Conservation System

Scenario: #240 - Plant Health PAMS (acs) Low Labor, materials and mitigation.

Scenario Description:
PAMS activities with low labor and material costs will be implemented plus mitigation on a large scale crop production area.

Before Situation:
Before practice conditions vary widely. Conditions range from the client is not using any PAMS techniques to the client is using many different PAMS techniques for many different pests. In all cases at least one planned PAMS technique has risk to an identified resource concern (Plant Pest Pressure). Mitigation up to 30 points.

After Situation:
Planned Prevention (Netting to exclude insect or birds, resistant cultivar selection, etc.), Avoidance (IWM for disease avoidance, change in rotation to avoid problem spots, etc.), and Monitoring (Degree day monitoring, field scouting, etc.) activities have been implemented to help meet the minimum criteria for the identified resource concerns (i.e. Plant Pest Pressure). Mitigation up to 30 points.

Feature Measure: Acres of Management Applied

Scenario Unit: Acres

Scenario Typical Size: 40.00

Scenario Total Cost: $2,593.53

Scenario Cost/Unit: $64.84

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.39	1	$116.39
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	8	$350.96
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	14	$1,560.30
Materials						
Miscellaneous, containers, traps, etc.	298	Pheromone Traps, Culture container with lid. Includes materials and shipping only.	Each	$4.90	10	$49.00
Weather Station, Basic	314	Basic Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, and temperature to a home weather console. Includes materials only.	Each	$287.20	1	$287.20

Practice: 595 - Pest Management Conservation System

Scenario: #241 - Plant Health PAMS (acs) High Labor and materials

Scenario Description:
PAMS activities with high labor and material costs will be implemented on a large scale crop production area (weather station, netting, field sanitation, mating disruption etc.).

Before Situation:
Before practice conditions vary widely. Conditions range from the client is not using any PAMS techniques to the client is using many different PAMS techniques for many different pests. In all cases at least one planned PAMS technique has risk to an identified resource concern (Plant Pest Pressure).

After Situation:
Planned Prevention (Netting to exclude insect or birds, resistant cultivar selection, etc.), Avoidance (IWM for disease avoidance, change in rotation to avoid problem spots, etc.), and Monitoring (Degree day monitoring, field scouting, etc.) activities have been implemented to help meet the minimum criteria for the identified resource concerns (i.e. Plant Pest Pressure).

Feature Measure: Acres of Management Applied

Scenario Unit: Acres

Scenario Typical Size: 40.00

Scenario Total Cost: $19,013.93

Scenario Cost/Unit: $475.35

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.39	1	$116.39
Equipment Installation						
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$75.12	150	$11,268.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	150	$4,306.50
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	30	$1,458.00
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	8	$891.60
Materials						
Weather Station, Advanced	2550	Advance Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, temperature, and solar radiation from a solar powered self-standing tripod to an advance weather recording console. Used for both 449 advance irrigation water management and for Activity 202 water quality monitoring .	Each	$973.44	1	$973.44

Practice: 595 - Pest Management Conservation System

Scenario: #242 - Plant health PAMS (Small Farm - each) labor only

Scenario Description:
PAMS activities with labor costs will be implemented on a small scale crop production area.

Before Situation:
Before practice conditions vary widely. Conditions range from the client is not using any PAMS techniques to the client is using many different PAMS techniques for many different pests. In all cases at least one planned PAMS technique has risk to an identified resource concern (Plant Pest Pressure).

After Situation:
Planned Prevention (resistant cultivar selection, pest habitat removal, etc.), Avoidance (IWM for disease avoidance, change in rotation to avoid problem spots, etc.), and Monitoring (field scouting, etc.) activities have been implemented to help meet the minimum criteria for the identified resource concerns (i.e. Plant Pest Pressure).

Feature Measure: Small farm, typically <= 5 ac

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $612.84

Scenario Cost/Unit: $612.84

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.39	1	$116.39
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	1	$43.87
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	2	$222.90

Practice: 595 - Pest Management Conservation System

Scenario: #244 - Plant Health PAMS activities (Small Farm - each) labor and materials

Scenario Description:
PAMS activities with labor and material costs will be implemented on a small scale crop production area.

Before Situation:
Before practice conditions vary widely. Conditions range from the client is not using any PAMS techniques to the client is using many different PAMS techniques for many different pests. In all cases at least one planned PAMS technique has risk to an identified resource concern (Plant Pest Pressure).

After Situation:
Planned Prevention (Netting to exclude insect or birds, resistant cultivar selection, etc.), Avoidance (IWM for disease avoidance, change in rotation to avoid problem spots, etc.), and Monitoring (Degree day monitoring, field scouting, etc.) activities have been implemented to help meet the minimum criteria for the identified resource concerns (i.e. Plant Pest Pressure).

Feature Measure: Small Farm, typically <= 5 ac

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $4,399.54

Scenario Cost/Unit: $4,399.54

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.39	1	$116.39
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	1	$43.87
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	2	$222.90
Materials						
Miscellaneous, containers, traps, etc.	298	Pheromone Traps, Culture container with lid. Includes materials and shipping only.	Each	$4.90	3	$14.70
Weather Station, Basic	314	Basic Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, and temperature to a home weather console. Includes materials only.	Each	$287.20	1	$287.20
Netting, Crop Protection, Large Mesh	2762	Synthetic netting, large mesh to exclude birds and small animals. Approximately 6 to 7 inch mesh. Includes materials and shipping only.	Square Feet	$0.04	87120	$3,484.80

Practice: 600 - Terrace

Scenario: #1 - Broadbased, Small less than 24 ft frontslope

Scenario Description:

An earthen embankment with channel constructed across the field slope as part of a system to shorten slope lengths and reduce sheet and rill erosion in a cropped field. The typical installation is a broadbase terrace storing runoff with a length of 1,500 feet, frontslope of 24 ft or less, and side slopes of 8:1 or flatter in a field with slopes from 2% to 8% constructed in loam soils or similar in regards to workability. Runoff is stored and handled with an underground outlet. Costs include all equipment and forces necessary to excavate, shape, and compact terrace. This practice addresses soil erosion and excessive sediment in surface waters.

Before Situation:

Long slope lengths contribute to excessive sedimentation and soil erosion in cropped fields as a result of rill and sheet erosion. The excessive erosion may lead to deterioration of receiving waters due to excessive sedimentation and nutrient transport.

After Situation:

A system of broadbased terraces measuring 1,500 feet in length, 2.5 height, and 8:1 front and back slopes is installed with spacing designed to intercept flow of water and shorten slope length to reduce erosion to acceptable levels. Work is done with a dozer and scraper pulled by a tractor. The installed terrace is typically farmed. Associated practices are Stormwater Runoff Control (570) and Underground Outlet (620).

Feature Measure: Length of Terrace

Scenario Unit: Feet

Scenario Typical Size: 1,500.00

Scenario Total Cost: $13,706.03

Scenario Cost/Unit: $9.14

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$100.26	38	$3,809.88
Scraper, self propelled, 21 CY	1208	Self propelled earthmoving scraper with 21 CY capacity. Does not include labor.	Hours	$296.28	19	$5,629.32
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	57	$2,287.41
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	6	$291.60
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 600 - Terrace

Scenario: #2 - Broadbase, Large 24 ft or more frontslope

Scenario Description:

An earthen embankment with channel constructed across the field slope as part of a system to shorten slope lengths and reduce sheet and rill erosion in a cropped field. The typical installation is a broadbase terrace storing runoff with a length of 1,500 feet, frontslope of more than 24 ft, and typically side slopes of 8:1 or flatter in a field with slopes from 2% to 8% constructed in loam soils or similar in regards to workability. Runoff is stored and handled with an underground outlet. Costs include all equipment and forces necessary to excavate, shape, and compact terrace. This practice addresses soil erosion and excessive sediment in surface waters.

Before Situation:

Long slope lengths contribute to excessive sedimentation and soil erosion in cropped fields as a result of rill and sheet erosion. The excessive erosion may lead to deterioration of receiving waters due to excessive sedimentation and nutrient transport.

After Situation:

A system of flat channel (level) terraces with approximately 8:1 front and back slopes, 2.5 feet height, and 1,500 feet in length is installed with spacing designed to intercept flow of water and shorten slope length to reduce erosion to acceptable levels. Work is done with a dozer and scraper pulled by a tractor. The installed terrace is typically farmed. Associated practices are Stormwater Runoff Control (570) and Underground Outlet (620).

Feature Measure: Length of Terrace

Scenario Unit: Feet

Scenario Typical Size: 1,500.00

Scenario Total Cost: $20,592.32

Scenario Cost/Unit: $13.73

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$100.26	60	$6,015.60
Scraper, self propelled, 21 CY	1208	Self propelled earthmoving scraper with 21 CY capacity. Does not include labor.	Hours	$296.28	30	$8,888.40
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	90	$3,611.70
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	8	$388.80
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 600 - Terrace

Scenario: #3 - Grassed Backslope

Scenario Description:
An earthen embankment with channel constructed across the field slope as part of a system to shorten slope lengths and reduce sheet and rill erosion in a cropped field. The typical installation is a system of terraces (1,500 feet in length and approximately 2.5 ft in average height) that have one relatively flat (5:1) slope and one steep (2:1) slope constructed in a field with slopes from 2% to 8% installed in loam soils or similar soils in regards to workability. The steep slope is established to permanent vegetation with the flatter slope farmed. A stable outlet is provided in the form of an Underground Outlet. Costs include all equipment and forces necessary to stip the base, place fill, shape, compact terrace, establish permanent vegetation and spread topsoil. This practice addresses soil erosion and excessive sediment in surface waters.

Before Situation:
Long slope lengths contribute to excessive sedimentation and soil erosion in cropped fields as a result of rill and sheet erosion. The excessive erosion may lead to deterioration of receiving waters due to excessive sedimentation and nutrient transport.

After Situation:
A system of terraces with one steep (2:1) and one flat (5:1) slope measuring 1,500 feet in length and 2.5' height is installed with spacing designed to intercept flow of water and shorten slope length to reduce erosion to acceptable levels. Work is done with dozer, scraper, or road grader. Associated practices are Mulching (484), Stormwater Runoff Control (570) and Underground Outlet (620).

Feature Measure: Length of Terrace

Scenario Unit: Feet

Scenario Typical Size: 1,500.00

Scenario Total Cost: $9,392.59

Scenario Cost/Unit: $6.26

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$100.26	33	$3,308.58
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	0.4	$5.95
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.61	0.2	$1.52
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	0.2	$4.45
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$75.12	16	$1,201.92
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$10.18	0.2	$2.04
Scraper, pull, 15 CY	1207	Pull type earthmoving scraper with 15 CY capacity. Does not include pulling equipment or labor. Add Tractor or Dozer, 260 HP typically required for single scraper.	Hours	$26.00	16	$416.00
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	49	$1,966.37
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	3	$145.80
Materials						
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	12	$8.16
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.81	12	$9.72
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	12	$8.16
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$26.18	0.4	$10.47
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$47.76	0.2	$9.55
Mobilization						

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	3	$2,293.89

Practice: 600 - Terrace

Scenario: #4 - Narrow Base greater than 8 percent

Scenario Description:

An earthen embankment with channel constructed across the field slope as part of a system to shorten slope lengths and reduce sheet and rill erosion in a cropped field. The typical installation is a system of narrow base terraces with 2:1 slopes, 1,500' length, and 3.5' height in a field with slopes exceeding 8% constructed in loam soils or similar in regards to workability. A stable outlet is provided in the form of a Grassed Waterway or Underground Outlet. Costs include all equipment and forces necessary to excavate, shape, and compact terrace. Permanent vegetation is established. This practice addresses soil erosion and excessive sediment in surface waters.

Before Situation:

Long slope lengths contribute to excessive sedimentation and soil erosion in cropped fields as a result of rill and sheet erosion. The excessive erosion may lead to deterioration of receiving waters due to excessive sedimentation and nutrient transport.

After Situation:

A system of narrow base terraces with approximately 2:1 front and back slopes measuring 1500 feet in length and 2.5' height is constructed with spacing designed to intercept flow of water and shorten slope length to reduce erosion to acceptable levels. Work is done with dozer, scraper, or road grader. Associated practices are Grassed Waterway (412), Mulching (484), Stormwater Runoff Control (570) and Underground Outlet (620).

Feature Measure: Length of Terrace

Scenario Unit: Feet

Scenario Typical Size: 1,500.00

Scenario Total Cost: $9,506.18

Scenario Cost/Unit: $6.34

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$100.26	60	$6,015.60
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	0.8	$11.90
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.61	0.4	$3.04
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$9.23	0.4	$3.69
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	0.4	$8.91
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$10.18	0.4	$4.07
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	60	$2,407.80
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	4	$194.40
Materials						
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	24	$16.32
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.81	24	$19.44
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	24	$16.32
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$26.18	0.8	$20.94
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$47.76	0.4	$19.10
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 600 - Terrace

Scenario: #5 - Narrow Base 8 percent or less

Scenario Description:

An earthen embankment with channel constructed across the field slope as part of a system to shorten slope lengths and reduce sheet and rill erosion in a cropped field. The typical installation is a system of narrow base terraces with 2:1 slopes, 1,500' length, and 3.5' height in a field with slopes from 3% to 8% constructed in loam soils or similar in regards to workability. A stable outlet is provided in the form of an Underground Outlet. Costs include all equipment and forces necessary to excavate, shape, and compact terrace. Permanent vegetation is established. This practice addresses soil erosion and excessive sediment in surface waters.

Before Situation:

Long slope lengths contribute to excessive sedimentation and soil erosion in cropped fields as a result of rill and sheet erosion. The excessive erosion may lead to deterioration of receiving waters due to excessive sedimentation and nutrient transport.

After Situation:

A system of narrow base terraces with approximately 2:1 front and back slopes measuring 1500 feet in length and 3.5 feet height is constructed with spacing designed to intercept flow of water and shorten slope length to reduce erosion to acceptable levels. Work is done with dozer, scraper, or road grader. Associated practices are Mulching (484), Stormwater Runoff Control (570) and Underground Outlet (620).

Feature Measure: Length of Terrace

Scenario Unit: Feet

Scenario Typical Size: 1,500.00

Scenario Total Cost: $6,395.32

Scenario Cost/Unit: $4.26

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$100.26	38	$3,809.88
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	1	$14.88
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.61	0.5	$3.81
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	0.5	$11.14
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$10.18	0.5	$5.09
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	38	$1,524.94
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	3	$145.80
Materials						
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	30	$20.40
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.81	30	$24.30
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	30	$20.40
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$26.18	1	$26.18
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$47.76	0.5	$23.88
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 600 - Terrace

Scenario: #6 - Graded, Broadbase, Less Than 1.5ft Average Height

Scenario Description:

An earthen embankment with channel constructed across the field slope as part of a system to shorten slope lengths and reduce sheet and rill erosion in a cropped field. The typical installation is a system of broadbase terraces with 8:1 slopes, 1,500' length, and 1' height in a field with loam soils or similar in regards to workability. A stable outlet is provided in the form of a Grassed Waterway. Costs include all equipment and forces necessary to excavate, shape, and compact terrace. Permanent vegetation is established. Seeding is not included. This practice addresses soil erosion and excessive sediment in surface waters.

Before Situation:

Long slope lengths contribute to excessive sedimentation and soil erosion in cropped fields as a result of rill and sheet erosion. The excessive erosion may lead to deterioration of receiving waters due to excessive sedimentation and nutrient transport.

After Situation:

A system of broadbase terraces with approximately 8:1 front and back slopes measuring 1,500 feet in length and 1' height is constructed with spacing designed to intercept flow of water and shorten slope length to reduce erosion to acceptable levels. Work is done with scraper or road grader. Associated practices are Critical Area Planting (342), Mulching (484), Stormwater Runoff Control (570) and Grassed Waterway (412).

Feature Measure: Length of Terrace

Scenario Unit: Feet

Scenario Typical Size: 1,500.00

Scenario Total Cost: $4,597.26

Scenario Cost/Unit: $3.06

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$75.12	20	$1,502.40
Scraper, pull, 15 CY	1207	Pull type earthmoving scraper with 15 CY capacity. Does not include pulling equipment or labor. Add Tractor or Dozer, 260 HP typically required for single scraper.	Hours	$26.00	20	$520.00
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	20	$802.60
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	5	$243.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 600 - Terrace

Scenario: #7 - Graded, Broadbase, Greater Than or Equal to 1.5ft Average Height

Scenario Description:

An earthen embankment with channel constructed across the field slope as part of a system to shorten slope lengths and reduce sheet and rill erosion in a cropped field. The typical installation is a system of broadbase terraces with 8:1 slopes, 1,500' length, and 2' height in a field with loam soils or similar in regards to workability. A stable outlet is provided in the form of a Grassed Waterway. Costs include all equipment and forces necessary to excavate, shape, and compact terrace. Permanent vegetation is established. Seeding is not included. This practice addresses soil erosion and excessive sediment in surface waters.

Before Situation:

Long slope lengths contribute to excessive sedimentation and soil erosion in cropped fields as a result of rill and sheet erosion. The excessive erosion may lead to deterioration of receiving waters due to excessive sedimentation and nutrient transport.

After Situation:

A system of broadbase terraces with approximately 8:1 front and back slopes measuring 1,500 feet in length and 2' height is constructed with spacing designed to intercept flow of water and shorten slope length to reduce erosion to acceptable levels. Work is done with dozer, scraper, or road grader. Associated practices are Critical Area Planting (342), Mulching (484), Stormwater Runoff Control (570) and Grassed Waterway (412).

Feature Measure: Length of Terrace

Scenario Unit: Feet

Scenario Typical Size: 1,500.00

Scenario Total Cost: $8,867.34

Scenario Cost/Unit: $5.91

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$100.26	30	$3,007.80
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$75.12	15	$1,126.80
Scraper, pull, 15 CY	1207	Pull type earthmoving scraper with 15 CY capacity. Does not include pulling equipment or labor. Add Tractor or Dozer, 260 HP typically required for single scraper.	Hours	$26.00	15	$390.00
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	45	$1,805.85
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	5	$243.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	3	$2,293.89

Practice: 600 - Terrace

Scenario: #8 - Graded, Narrow Base or Grass Backslope

Scenario Description:

An earthen embankment with channel constructed across the field slope as part of a system to shorten slope lengths and reduce sheet and rill erosion in a cropped field. The typical installation is a system of narrow base or grassed backslope terraces with approximately 2:1 slopes, 1,500' length, and 1.5' height in a field with loam soils or similar in regards to workability. A stable outlet is provided in the form of a Grassed Waterway. Costs include all equipment and forces necessary to excavate, shape, and compact terrace. Permanent vegetation is established. This practice addresses excessive sediment in surface waters.

Before Situation:

Long slope lengths contribute to excessive sedimentation and soil erosion in cropped fields as a result of rill and sheet erosion. The excessive erosion may lead to deterioration of receiving waters due to excessive sedimentation and nutrient transport.

After Situation:

A system of narrow base or grass backslope terraces measuring 1,500 feet in length and 1.5' height is constructed with spacing designed to intercept flow of water and shorten slope length to reduce erosion to acceptable levels. Work is done with dozer, scraper, or road grader. Associated practices are Mulching (484), Stormwater Runoff Control (570) and Grassed Waterway (412).

Feature Measure: Length of Terrace

Scenario Unit: Feet

Scenario Typical Size: 1,500.00

Scenario Total Cost: $2,673.72

Scenario Cost/Unit: $1.78

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$100.26	12	$1,203.12
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	0.2	$2.98
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.61	0.1	$0.76
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	0.1	$2.23
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$10.18	0.1	$1.02
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	12	$481.56
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	4	$194.40
Materials						
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	6	$4.08
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.81	6	$4.86
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	6	$4.08
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$26.18	0.2	$5.24
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$47.76	0.1	$4.78
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 600 - Terrace

Scenario: #9 - Terrace Rehab

Scenario Description:

Rehabilitation of a terrace which has exceeded its lifespan and requires realignment/reshape continue functioning. Consists of an earthen embankment with channel constructed across the field slope as part of a system to shorten slope lengths and reduce sheet and rill erosion in a cropped field. The typical installation is a system of terraces that have exceeded their useful life and need to be reshaped. The work involves substantial rework of the embankment and channel which exceeds routine maintenance needs. Costs include all equipment and forces necessary to rework, shape, and compact terrace. Permanent vegetation is established if needed. Seeding is not included. This practice addresses excessive sediment in surface waters.

Before Situation:

Existing terraces are beyond their useful life and no longer function as intended. Overtopping is frequent and long slope lengths contribute to excessive sedimentation and soil erosion in cropped fields as a result of rill and sheet erosion. The excessive erosion may lead to deterioration of receiving waters due to excessive sedimentation and nutrient transport.

After Situation:

Rehabilitated system of terraces measuring 1,500 feet in length at original spacing, designed to intercept flow of water and shorten slope length to reduce erosion to acceptable levels. Work is done with dozer, scraper, or road grader. Associated practices are Critical Area Planting (342) Mulching (484) and Stormwater Runoff Control (570) .

Feature Measure: Length of Terrace

Scenario Unit: Feet

Scenario Typical Size: 1,500.00

Scenario Total Cost: $5,170.73

Scenario Cost/Unit: $3.45

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$100.26	30	$3,007.80
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	30	$1,203.90
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	4	$194.40
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 600 - Terrace

Scenario: #54 - Broadbased

Scenario Description:

An earthen embankment with channel constructed across the field slope as part of a system to shorten slope lengths and reduce sheet, rill, and gully erosion in a cropped field. The typical installation is a broadbased terrace having 5:1 upstream and 5:1 downstream slopes measuring 2,500 feet in a field with slopes from 2% to 8% constructed in loam soils or similar in regards to workability. Channel and berm are farmed. A stable outlet is provided in the form of a Grassed Waterway or Underground Outlet. Costs include all equipment and forces necessary to excavate, shape, and compact terrace. This practice addresses Concentrated Flow Erosion and Excessive Sediment in surface waters.

Before Situation:

Long slope lengths contribute to excessive sedimentation and soil erosion in cropped fields as a result of gully, rill, and sheet erosion. The excessive erosion may lead to deterioration of receiving waters due to excessive sedimentation and nutrient transport.

After Situation:

A system of broadbased terraces measuring 2,500 feet in length, 2.5 height, and 5:1 front and back slopes is installed with spacing designed to intercept flow of water and shorten slope length to reduce erosion to acceptable levels. Work is done with dozer, scraper, or road grader. The installed terrace is typically farmed. Associated practices are Critical Area Planting (342), Grassed Waterway (412), and Underground Outlet (620).

Feature Measure: Length of Terrace

Scenario Unit: Feet

Scenario Typical Size: 2,500.00

Scenario Total Cost: $5,829.49

Scenario Cost/Unit: $2.33

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$100.26	34	$3,408.84
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	34	$1,364.42
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	6	$291.60
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 600 - Terrace

Scenario: #55 - Flat Channel

Scenario Description:

An earthen embankment with channel constructed across the field slope as part of a system to shorten slope lengths, and reduce sheet, rill, and gully erosion in a cropped field. The typical installation is a flat channel (level) terrace storing runoff with a length of 2,500 feet and side slopes of 8:1 or greater in a field with slopes from 2% to 8% constructed in loam soils or similar in regards to workability. Costs include all equipment and forces necessary to excavate, shape, and compact terrace. This practice addresses Concentrated Flow Erosion and Excessive Sediment in surface waters.

Before Situation:

Long slope lengths contribute to excessive sedimentation and soil erosion in cropped fields as a result of gully, rill, and sheet erosion. The excessive erosion may lead to deterioration of receiving waters due to excessive sedimentation and nutrient transport.

After Situation:

A system of flat channel (level) terraces with approximately 8:1 front and back slopes, 2.5 feet height, and 2,500 feet in length is installed with spacing designed to intercept flow of water and shorten slope length to reduce erosion to acceptable levels. Work is done with dozer, scraper, or road grader. The installed terrace is typically farmed. Associated practices are Critical Area Planting (342), Grassed Waterway (412), and Underground Outlet (620).

Feature Measure: Length of Terrace

Scenario Unit: Feet

Scenario Typical Size: 2,500.00

Scenario Total Cost: $9,155.66

Scenario Cost/Unit: $3.66

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$100.26	57	$5,714.82
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	57	$2,287.41
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	8	$388.80
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 600 - Terrace

Scenario: #56 - Grass Backed

Scenario Description:

{Only name change from 5 to 1 & 2 to 1 to Grass Back} An earthen embankment with channel constructed across the field slope as part of a system to shorten slope lengths and reduce sheet, rill, and gully erosion in a cropped field. The typical installation is a system of terraces (2,500 feet in length) that have one relatively flat (5:1) slope and one steep (2:1) slope constructed in a field with slopes from 2% to 8% installed in loam soils or similar soils in regards to workability. The steep slope is established to permanent vegetation with the flatter slope farmed. A stable outlet is provided in the form of a Grassed Waterway or Underground Outlet. Costs include all equipment and forces necessary to excavate, shape, and compact terrace. Seeding is not included. This practice addresses Concentrated Flow Erosion and Excessive Sediment in surface waters.

Before Situation:

Long slope lengths contribute to excessive sedimentation and soil erosion in cropped fields as a result of gully, rill, and sheet erosion. The excessive erosion may lead to deterioration of receiving waters due to excessive sedimentation and nutrient transport.

After Situation:

A system of terraces with one steep (2:1) and one flat (5:1) slope measuring 2,500 feet in length and 2.5' height is installed with spacing designed to intercept flow of water and shorten slope length to reduce erosion to acceptable levels. Work is done with dozer, scraper, or road grader. Associated practices are Critical Area Planting (342), Grassed Waterway (412), and Underground Outlet (620).

Feature Measure: Length of Terrace

Scenario Unit: Feet

Scenario Typical Size: 2,500.00

Scenario Total Cost: $3,577.84

Scenario Cost/Unit: $1.43

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$100.26	19	$1,904.94
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	19	$762.47
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	3	$145.80
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 600 - Terrace

Scenario: #57 - Narrow Base, less than 8% slope

Scenario Description:

An earthen embankment with channel constructed across the field slope as part of a system to shorten slope lengths and reduce sheet, rill, and gully erosion in a cropped field. The typical installation is a system of narrow base terraces with 2:1 slopes, 2,500' length, and 2.5' height in a field with slopes from 3% to 8% constructed in loam soils or similar in regards to workability. A stable outlet is provided in the form of a Grassed Waterway or Underground Outlet. Costs include all equipment and forces necessary to excavate, shape, and compact terrace. Permanent vegetation is established. Seeding is not included. This practice addresses Concentrated Flow Erosion and Excessive Sediment in surface waters.

Before Situation:

Long slope lengths contribute to excessive sedimentation and soil erosion in cropped fields as a result of gully, rill, and sheet erosion. The excessive erosion may lead to deterioration of receiving waters due to excessive sedimentation and nutrient transport.

After Situation:

A system of narrow base terraces with approximately 2:1 front and back slopes measuring 2,500 feet in length and 2.5 feet height is constructed with spacing designed to intercept flow of water and shorten slope length to reduce erosion to acceptable levels. Work is done with dozer, scraper, or road grader. Associated practices are Critical Area Planting (342), Grassed Waterway (412), and Underground Outlet (620).

Feature Measure: Length of Terrace

Scenario Unit: Feet

Scenario Typical Size: 2,500.00

Scenario Total Cost: $4,279.79

Scenario Cost/Unit: $1.71

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$100.26	24	$2,406.24
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	24	$963.12
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	3	$145.80
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 600 - Terrace

Scenario: #58 - Narrow Base, greater than 8% slope

Scenario Description:

An earthen embankment with channel constructed across the field slope as part of a system to shorten slope lengths and reduce sheet, rill, and gully erosion in a cropped field. The typical installation is a system of narrow base terraces with 2:1 slopes, 2,500' length, and 2.5' height in a field with slopes exceeding 8% constructed in loam soils or similar in regards to workability. A stable outlet is provided in the form of a Grassed Waterway or Underground Outlet. Costs include all equipment and forces necessary to excavate, shape, and compact terrace. Permanent vegetation is established. Seeding is not included. This practice addresses Concentrated Flow Erosion and Excessive Sediment in surface waters.

Before Situation:

Long slope lengths contribute to excessive sedimentation and soil erosion in cropped fields as a result of gully, rill, and sheet erosion. The excessive erosion may lead to deterioration of receiving waters due to excessive sedimentation and nutrient transport.

After Situation:

A system of narrow base terraces with approximately 2:1 front and back slopes measuring 2,500 feet in length and 2.5' height is constructed with spacing designed to intercept flow of water and shorten slope length to reduce erosion to acceptable levels. Work is done with dozer, scraper, or road grader. Associated practices are Critical Area Planting (342), Grassed Waterway (412), and Underground Outlet (620).

Feature Measure: Length of Terrace

Scenario Unit: Feet

Scenario Typical Size: 2,500.00

Scenario Total Cost: $4,609.17

Scenario Cost/Unit: $1.84

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$100.26	26	$2,606.76
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	26	$1,043.38
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	4	$194.40
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 601 - Vegetative Barrier

Scenario: #2 - Seeded Barrier

Scenario Description:
Permanent strips of stiff, dense vegetation established along the general contour of slopes.

Before Situation:
Significant erosion is occurring resulting in substantial transport of sediment across the slope. A large amount of sediment is subsequently delivered to the edge of the field and/or waterways.

After Situation:
Implementation Requirements are prepared and implemented for the site according to the Vegetative Barrier (601) standard. A strip or strips of stiff, dense vegetation is established by seeding along the general contour of the slope that effectively settles a significant amount of sediment above the leading edge of the vegetative barrier. Barrier may also help to connect green areas to provide shelter for wildlife.

Feature Measure: Per 1000 Linear feet of practice inst

Scenario Unit: Feet

Scenario Typical Size: 1,000.00

Scenario Total Cost: $320.35

Scenario Cost/Unit: $0.32

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	0.09	$1.34
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	0.09	$2.00
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$10.18	0.09	$0.92
Materials						
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$134.97	0.09	$12.15
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 601 - Vegetative Barrier

Scenario: #3 - Vegetative Planting

Scenario Description:
Permanent strips of stiff, dense vegetation established along the general contour of slopes.

Before Situation:
Significant erosion is occurring resulting in substantial transport of sediment across the slope. A large amount of sediment is subsequently delivered to the edge of the field and/or waterways.

After Situation:
Implementation Requirements are prepared and implemented for the site according to the Vegetative Barrier (601) standard. A strip or strips of stiff, dense vegetation such as Vetiver Grass is/are established along the general contour of the slope that effectively settles a significant amount of sediment above the leading edge of the vegetative barrier. Barrier may also help to connect green areas to provide shelter for wildlife.

Feature Measure: Per 100 foot Linear feet of practice

Scenario Unit: Feet

Scenario Typical Size: 100.00

Scenario Total Cost: $860.01

Scenario Cost/Unit: $8.60

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	0.01	$0.07
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.61	0.01	$0.08
Ground sprigging	1101	Includes costs for equipment, power unit and labor.	Acres	$66.64	0.01	$0.67
Materials						
Nitrogen (N), Ammonium Sulfate	70	Price per pound of N supplied by Ammonium Sulfate. Price is not per pound of total product applied, no conversion is needed.	Pound	$1.03	0.46	$0.47
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$12.66	0.01	$0.13
Perennial Grass, Legume, and/or Forb Liners or Plugs, linear planting per 100 feet	2324	Perennial grasses, legumes and/or forbs established in a row using vegetative propagules including liners or plugs. Includes materials and shipping.	100 Foot	$858.60	1	$858.60

Practice: 601 - Vegetative Barrier

Scenario: #9 - Caribbean and Virgin Island Veg Barriers with Cuttings

Scenario Description:
Permanent strips of stiff, dense vegetation established along the general contour of slopes.

Before Situation:
Significant erosion is occurring resulting in substantial sheet and rill erosion. A large amount of sediment is subsequently delivered to the edge of the field and/or waterways, and the soil resource is degraded.

After Situation:
Implementation Requirements for 601 are prepared for the unique site conditions and the practice is implemented. A strip or strips of stiff, dense vegetation such as Vetivier Grass is/are established along the general contour of the slope that effectively settles a significant amount or sediment above the leading edge of the vegetative barrier. Barrier may also help to connect green areas to provide shelter for wildlife.

Feature Measure: Length treated

Scenario Unit: 100 Foot

Scenario Typical Size: 1.00

Scenario Total Cost: $1,277.40

Scenario Cost/Unit: $1,277.40

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Track Loader, 95HP	935	Equipment and power unit costs. Labor not included.	Hours	$97.06	2	$194.12
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	2	$50.72
Site Preparation, Mechanical	944	Aerator, rolling drum chopper, etc. Includes equipment, power unit and labor costs.	Acres	$89.37	0.01	$0.89
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	6	$172.26
Materials						
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.81	1	$0.81
Perennial Grass, Legume, and/or Forb Liners or Plugs, linear planting per 100 feet	2324	Perennial grasses, legumes and/or forbs established in a row using vegetative propagules including liners or plugs. Includes materials and shipping.	100 Foot	$858.60	1	$858.60

Practice: 601 - Vegetative Barrier

Scenario: #10 - Pac. Island Area Vegetative Barrier

Scenario Description:
Permanent strips of stiff, dense vegetation established along the general contour of slopes.

Before Situation:
Significant erosion is occurring resulting in substantial transport of sediment across the slope. A large amount of sediment is subsequently delivered to the edge of the field and/or waterways.

After Situation:
Implementation Requirements are prepared for the site according to the 601 Vegetative Barrier Standard and is implemented. A strip or strips of stiff, dense vegetation such as Vetivier Grass is/are established along the general contour of the slope that effectively settles a significant amount or sediment above the leading edge of the vegetative barrier. Barrier may also help to connect green areas to provide shelter for wildlife.

Feature Measure: Linear feet planted

Scenario Unit: Feet

Scenario Typical Size: 1,000.00

Scenario Total Cost: $8,864.28

Scenario Cost/Unit: $8.86

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	1	$48.60
Materials						
Perennial Grass, Legume, and/or Forb Liners or Plugs, linear planting per 100 feet	2324	Perennial grasses, legumes and/or forbs established in a row using vegetative propagules including liners or plugs. Includes materials and shipping.	100 Foot	$858.60	10	$8,586.00

Practice: 601 - Vegetative Barrier

Scenario: #11 - Pacific Islands Area - Vegetative Barrier for Small Area

Scenario Description:
Permanent strips of stiff, dense vegetation established along the general contour of slopes for small areas needing erosion control.

Before Situation:
Significant erosion is occurring resulting in substantial transport of sediment across the slope. A large amount of sediment is subsequently delivered to the edge of the field and/or waterways.

After Situation:
Implementation Requirements are prepared for the site according to the 601 Vegetative Barrier Standard and is implemented. A strip or strips of stiff, dense vegetation of a warm season grass established along the general contour of the slope that effectively settles a significant amount or sediment above the leading edge of the vegetative barrier. Barrier may also help to connect green areas to provide shelter for wildlife.

Feature Measure: Number of 100 ft segments

Scenario Unit: 1,000 Foot

Scenario Typical Size: 1.00

Scenario Total Cost: $8,749.44

Scenario Cost/Unit: $8,749.44

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	4	$114.84
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	1	$48.60
Materials						
Perennial Grass, Legume, and/or Forb Liners or Plugs, linear planting per 100 feet	2324	Perennial grasses, legumes and/or forbs established in a row using vegetative propagules including liners or plugs. Includes materials and shipping.	100 Foot	$858.60	10	$8,586.00

Practice: 603 - Herbaceous Wind Barriers

Scenario: #1 - Cool Season Annual/Perennial Species

Scenario Description:

This scenario describes the implementation of herbaceous barriers to reduce wind velocities and wind-borne particulate matter. In this scenario barriers are composed of cool season annual or perennial vegetation. Plant materials shall be selected for local adaptation and climatic conditions and are resistant to lodging and are non-spreading in their habit. Barriers will be designed as close to perpendicular to prevailing winds as practical. Barrier direction, spacing, and composition needed to achieve the desired purpose shall be designed using the currently approved wind erosion technology.

Before Situation:

Typically cropland has excessive soil disturbance and unsheltered distance that results in excessive wind erosion that affect soil resources. Seedling development and wildlife habitat are negatively affected by wind-borne sediment and sediment-borne contaminants travelling offsite.

After Situation:

Implementation Requirements will be prepared and implemented for the site according to the Herbaceous Wind Barrier (603) standard. Implementation of herbaceous wind barriers will modify the flow and velocity of air dependent upon barrier height, porosity, spacing and wind speed. Orientation is generally placed across an entire field perpendicular to applicable prevailing wind direction. Implementation will reduce soil loss, protect growing plants from damage by wind-blown soil particles, and provide food and cover for wildlife. The scenario includes the design and implementation of annual barriers and required reestablishment.

Feature Measure: linear feet of barrier planted

Scenario Unit: Linear Feet

Scenario Typical Size: 1,320.00

Scenario Total Cost: $134.08

Scenario Cost/Unit: $0.10

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	2	$50.72
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	1	$22.27
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	2	$57.42
Materials						
Annual Grasses	2730	Annual grasses, one or more species, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$40.79	0.09	$3.67

Practice: 603 - Herbaceous Wind Barriers

Scenario: #6 - Small Farm Herbaceous Barrier

Scenario Description:

This scenario describes the annual implementation of herbaceous barriers to reduce wind velocities and wind-borne particulate matter. In this scenario barriers are composed of annual living vegetation. Plant materials shall be selected for local adaptation and climatic conditions and are resistant to lodging and are non-spreading in their habit. Barriers will be designed as close to perpendicular to prevailing winds as practical. Barrier direction, spacing, and composition needed to achieve the desired purpose shall be designed using the currently approved wind erosion technology. Establishment is done either by using light tillage or chemical application and no till drill.

Before Situation:

Typically cropland has excessive soil disturbance and un-sheltered distance that results in excessive wind erosion that affect soil resources. Seedling development and wildlife habitat are negatively affected by wind-borne sediment and sediment-borne contaminants travelling offsite.

After Situation:

Implementation Requirements will be prepared for the site according to the 603 Herbaceous Wind Barrier Standard and implemented. Implementation of herbaceous wind barriers will modify the flow and velocity of air dependent upon barrier height, porosity, spacing and wind speed. Orientation is generally placed across an entire field perpendicular to applicable prevailing wind direction. Implementation will reduce soil loss; protect growing plants from damage by wind blown soil particles, provide food and cover for wildlife. Payment is for the design and implementation of annual barriers and required reestablishment.

Feature Measure: Linear Feet Planted

Scenario Unit: Feet

Scenario Typical Size: 1,000.00

Scenario Total Cost: $316.40

Scenario Cost/Unit: $0.32

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	1	$14.88
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	0.5	$11.14
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	2	$222.90
Materials						
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$134.97	0.5	$67.49

Practice: 603 - Herbaceous Wind Barriers

Scenario: #7 - Pacific Island Area Herbaceous Wind Barriers

Scenario Description:

This is for the Pacific Island Area. This scenario describes implementation of warm or cool season perennial herbaceous barriers to reduce wind velocities and wind-borne particulate matter. In this scenario barriers are composed of annual living vegetation. Plant materials shall be selected for local adaptation and climatic conditions and are resistant to lodging and are non-spreading in their habit. Barriers will be designed as close to perpendicular to prevailing winds as practical. Barrier direction, spacing, and composition needed to achieve the desired purpose shall be designed using the currently approved wind erosion technology. Establishment is done either by using light tillage or chemical application and no till drill.

Before Situation:

Typically cropland has excessive soil disturbance and unsheltered distance that results in excessive wind erosion that affect soil resources. Seedling development and wildlife habitat are negatively affected by wind-borne sediment and sediment-borne contaminants travelling offsite.

After Situation:

Implementation Requirements will be prepared for the site according to the 603 Herbaceous Wind Barrier Standard and implemented. Implementation of perennial herbaceous wind barriers will modify the flow and velocity of air dependent upon barrier height, porosity, spacing and wind speed. Orientation is generally placed across an entire field perpendicular to applicable prevailing wind direction. Implementation will reduce soil loss; protect growing plants from damage by wind blown soil particles, provide food and cover for wildlife. Payment is for the establishment of perennial barriers and required reestablishment.

Feature Measure: Feet established

Scenario Unit: Feet

Scenario Typical Size: 1,320.00

Scenario Total Cost: $128.22

Scenario Cost/Unit: $0.10

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	1	$25.36
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	0.06	$0.89
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	0.06	$1.34
Foregone Income						
FI, Soybeans Irrigated	1962	Irrigated Soybeans is Primary Crop	Acres	$403.06	0.02	$8.06
FI, Wheat Irrigated	1964	Irrigated Wheat is Primary Crop	Acres	$418.68	0.02	$8.37
FI, Vegetables	2033	Vegetables is Primary Crop	Acres	$2,088.46	0.02	$41.77
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	1	$28.71
Materials						
Native and Introduced Perennial Grasses, Legumes and/or Forbs, High Density	2757	A mix of native and introduced perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping.	Acres	$228.68	0.06	$13.72

Practice: 604 - Saturated Buffer

Scenario: #3 - Saturated Buffer

Scenario Description:
Water discharging from a subsurface drainage system is dispersed along a buffer strip (often a riparian buffer). The water flows underground through the buffer area where nutrients and sediment can be removed before the water reaches the stream. Water is directed to the underground distribution pipe using a water control structure. Resource Concerns: Water Quality Degradation (Nutrients) Associated Practices: 606 - Subsurface Drain; 554 - Drainage Water Management; 587 - Structure for Water Control

Before Situation:
Water from a subsurface drainage system flows directly into a stream, carrying sediment and nutrients.

After Situation:
Water from a subsurface drainage system is dispersed through at 400 feet of 5' HDPE single wall perforated pipe tile drain along an established vegetated buffer strip at least 30 feet from the receiving stream. Drainage pipe is trenched in at 4 feet depth. The water is detained by passing underground where the nitrogen is removed by bacteria and natural processes.

Feature Measure: Length of buffer

Scenario Unit: Feet

Scenario Typical Size: 400.00

Scenario Total Cost: $5,161.76

Scenario Cost/Unit: $12.90

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, Earth, 12 in. x 48 in.	53	Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling	Feet	$1.43	400	$572.00
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	2	$132.36
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	4	$114.84
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	8	$242.88
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	4	$194.40
Materials						
Pipe, HDPE, corrugated single wall, <= 12 in. weight priced Compound	1380	High Density Polyethylene (HDPE) compound manufactured into single wall corrugated pipe or tubing. Materials only.	Pound	$2.09	200	$418.00
Water Control Structure, Stoplog, Inline, fixed costs portion	2145	Fixed cost portion of Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Materials only.	Each	$367.01	1	$367.01
Water Control Structure, Stoplog, Inline, variable cost portion	2146	Variable cost portion of a Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Calculate total variable costs by multiplying by the structure height x pipe diameter. Materials only.	Height x Diameter	$18.68	60	$1,120.80
Pipe, HDPE, corrugated double wall, <= 12-inch, watertight, weight priced	2816	High Density Polyethylene (HDPE) compound manufactured into double wall corrugated pipe <= 12-inch diameter. Materials only.	Pound	$3.72	92.4	$343.73
Pipe, HDPE, corrugated double wall, <= 12-inch, watertight, weight priced	2816	High Density Polyethylene (HDPE) compound manufactured into double wall corrugated pipe <= 12-inch diameter. Materials only.	Pound	$3.72	34	$126.48
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 604 - Saturated Buffer

Scenario: #11 - Saturated Buffer with Automated Water Control Structure

Scenario Description:
Water discharging from a subsurface drainage system is dispersed along a buffer strip (often a riparian buffer). The water flows underground through the buffer area where nutrients and sediment can be removed before the water reaches the stream. Water is directed to the underground distribution pipe using an automated water control structure. Resource Concerns: Water Quality Degradation (Nutrients) Associated Practices: 606 - Subsurface Drain; 554 - Drainage Water Management; 587 - Structure for Water Control

Before Situation:
Water from a subsurface drainage system flows directly into a stream, carrying sediment and nutrients.

After Situation:
Water from a subsurface drainage system is dispersed through at 400 feet of 5' HDPE single wall perforated pipe tile drain along an established vegetated buffer strip at least 30 feet from the receiving stream. Drainage pipe is trenched in at 4 feet depth. The water control structure is automated. The water is detained by passing underground where the nitrogen is removed by bacteria and natural processes.

Feature Measure: Length of buffer

Scenario Unit: Feet

Scenario Typical Size: 400.00

Scenario Total Cost: $8,200.88

Scenario Cost/Unit: $20.50

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, Earth, 12 in. x 48 in.	53	Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling	Feet	$1.43	400	$572.00
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	2	$132.36
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	3	$131.61
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	4	$114.84
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	8	$242.88
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	4	$194.40
Materials						
Switches and Controls, programmable controller	1193	Programmable logic controller (with or without wireless telecommunications) commonly used to control pumps and irrigation systems	Each	$623.08	1	$623.08
Pipe, HDPE, corrugated single wall, <= 12 in. weight priced Compound	1380	High Density Polyethylene (HDPE) compound manufactured into single wall corrugated pipe or tubing. Materials only.	Pound	$2.09	200	$418.00
Data Logger with Telemetry System	1454	Data Logger W/Graphic Output for water management and telemetry - data communication device with power supply in a weather proof enclosure. Equipment only.	Each	$1,663.47	1	$1,663.47
Water Control Structure, Stoplog, Inline, fixed costs portion	2145	Fixed cost portion of Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Materials only.	Each	$367.01	1	$367.01
Water Control Structure, Stoplog, Inline, variable cost portion	2146	Variable cost portion of a Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Calculate total variable costs by multiplying by the structure height x pipe diameter. Materials only.	Height x Diameter	$18.68	60	$1,120.80
Valve, Inline, < 12 inch dia.	2367	Inline valve less than 12 inch diameter to control direction and volume of flow within a pipeline system. Materials only.	Each	$468.77	1	$468.77
Light Duty Linear Actuator	2724	12VDC aluminum light duty linear actuator with 12??? stroke and potentiometer. 110 lb dynamic load rating with 20:1 gear ratio, 500 lb static load rating.	Each	$152.19	1	$152.19

Pipe, HDPE, corrugated double wall, <= 12-inch, watertight, weight priced	2816	High Density Polyethylene (HDPE) compound manufactured into double wall corrugated pipe <= 12-inch diameter. Materials only.	Pound	$3.72	92.4	$343.73
Pipe, HDPE, corrugated double wall, <= 12-inch, watertight, weight priced	2816	High Density Polyethylene (HDPE) compound manufactured into double wall corrugated pipe <= 12-inch diameter. Materials only.	Pound	$3.72	34	$126.48
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 605 - Denitrifying Bioreactor

Scenario: #3 - Bioreactor With Soil Cover

Scenario Description:

This practice is installed at the outlet of a subsurface drainage system. The water passes through a structure (with overflow bypass) which disperses it through a volume of woodchips (or equivalent material as supported by research) where the nitrogen is converted such that the discharged water has a reduced level of nitrogen compared to the initial inflow. Typical trench size is 15' wide x 100' long x 5' deep. A typical installation consists of a control structure used to control inflow into and bypass flow around the structure and a second control structure is used to control outflow from the bioreactor. The bioreactor has geotextile fabric lining the trench and between the wood chips and the soil cover. Typical components include: woodchip filled pit, a soil cover, two water control structures each with one baffle, and piping to convey water to and from the bioreactor. Woodchips serve as the carbon source necessary to the denitrification process. 20% settling of wood chips may occur but volume based on neat line in drawings. The water control structure should meet the requirement of Practice Standard 587 Structure for Water Control. Associated practices: Subsurface Drain (606), Drainage Water Management (554). Resource concern: Water Quality Degradation - Excess nutrients in surface and ground waters. Management and maintenance of the bioreactor (including chip replenishment), as well as monitoring and reporting to demonstrate the performance of the practice are not included in this scenario.

Before Situation:

Before the installation, the subsurface drainage system is contributing nitrates to a surface water source (ditch or stream), high nitrates are a resource concern to the receiving water, and it is feasible to install a bioreactor to reduce the nitrate load from drainage outflows.

After Situation:

Water is detained in a bioreactor where bacteria break down nitrogen such that it is not discharged to surface waters. All components of the bioreactor are installed and functional. Nitrates are removed from bioreactor outflow. The approximate bioreactor excavated pit volume is 280 cubic yards (e.g. 5 feet deep, 15 feet wide and 100 feet long). Woodchips occupy the lower ~3.5 feet of the pit (200 cu. yd.) and a soil blanket over the woodchips is mounded 1.0 ft. above the surrounding ground surface to shed water and account for settling. One inline water control structure with one baffle is used for inlet and bypass flow and a second water control structure with one baffle is used for outlet flow. The structure is connected to the two 6' diameter HDPE dual-wall manifold pipes by 10' diameter dual wall pipe. Flow rates are dependent upon the availability of drainage water from the 10' drainage mainline. The soil excavated from the pit is spoiled onto the nearby field.

Feature Measure: Volume of Carbon Source

Scenario Unit: Cubic Yards

Scenario Typical Size: 200.00

Scenario Total Cost: $22,187.07

Scenario Cost/Unit: $110.94

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.11	780	$865.80
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	280	$705.60
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.45	140	$483.00
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$56.88	26	$1,478.88
Aggregate, Wood Chips	1098	Includes materials, equipment and labor to transport and place.	Cubic Yards	$50.92	200	$10,184.00
Trenching, Earth, 24 in. x 60 in.	1460	Trenching, earth, 24 inch wide x 60 inch depth, includes equipment and labor for trenching and backfilling.	Feet	$3.76	105	$394.80
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	12	$344.52
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	26	$789.36
Materials						
Pipe, HDPE, corrugated single wall, <= 12 in. weight priced Compound	1380	High Density Polyethylene (HDPE) compound manufactured into single wall corrugated pipe or tubing. Materials only.	Pound	$2.09	22.8	$47.65
Water Control Structure, Stoplog, Inline, fixed costs portion	2145	Fixed cost portion of Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Materials only.	Each	$367.01	2	$734.02
Water Control Structure, Stoplog, Inline, variable cost portion	2146	Variable cost portion of a Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Calculate total variable costs by multiplying by the structure height x pipe diameter. Materials only.	Height x Diameter	$18.68	120	$2,241.60

Pipe, HDPE, corrugated double wall, <= 12-inch, watertight, weight priced	2816	High Density Polyethylene (HDPE) compound manufactured into double wall corrugated pipe <= 12-inch diameter. Materials only.	Pound	$3.72	231	$859.32
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	4	$3,058.52

Practice: 605 - Denitrifying Bioreactor

Scenario: #4 - Bioreactor Without Soil Cover

Scenario Description:

This practice is installed at the outlet of a subsurface drainage system. The water passes through a structure (with overflow bypass) which disperses it through a volume of woodchips (or equivalent material as supported by research) where the nitrogen is converted such that the discharged water has a reduced level of nitrogen compared to the initial inflow. Typical trench size is 15' wide x 100' long x 5' deep. A typical installation consists of one structure used to control inflow into and bypass flow around the structure and a second structure used to control outflow from the bioreactor. This bioreactor has geotextile fabric lining the bottom and sides of the trench. Typical components include: woodchip filled pit, two water control structures each with one baffle, and piping to convey water to and from the bioreactor. Woodchips serve as the carbon source necessary to the denitrification process. 20% settling of wood chips may occur but volume based on neat line in drawings. The water control structure should meet the requirement of Practice Standard 587 Structure for Water Control.Associated practices: Subsurface Drain (606), Drainage Water Management (554).

Before Situation:

Before the installation, the subsurface drainage system is contributing nitrates to a surface water source (ditch or stream), high nitrates are a resource concern to the receiving water, and it is feasible to install a bioreactor to reduce the nitrate load from drainage outflows.

After Situation:

Water is detained in a bioreactor where bacteria break down nitrogen such that it is not discharged to surface waters. All components of the bioreactor are installed and functional. Nitrates are removed from bioreactor outflow. The approximate bioreactor excavated pit volume is 280 cubic yards (e.g. 5 feet deep, 15 feet wide and 100 feet long). Woodchips occupy the entire pit and are mounded 1.0 ft. above the surrounding ground surface to shed water and account for settling. One inline water control structure with one baffle is used for inlet and bypass flow and a second water control structure with one baffle is used for outlet flow. The structure is connected to the two 6' diameter HDPE dual-wall manifold pipes by 10' diameter dual wall pipe. Flow rates are dependent upon the availability of drainage water from the 10' drainage mainline. The soil excavated from the pit is spoiled onto the nearby field.

Feature Measure: Volume of Carbon Source

Scenario Unit: Cubic Yards

Scenario Typical Size: 340.00

Scenario Total Cost: $28,931.33

Scenario Cost/Unit: $85.09

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.11	470	$521.70
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	280	$705.60
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.45	280	$966.00
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$56.88	20	$1,137.60
Aggregate, Wood Chips	1098	Includes materials, equipment and labor to transport and place.	Cubic Yards	$50.92	340	$17,312.80
Trenching, Earth, 24 in. x 60 in.	1460	Trenching, earth, 24 inch wide x 60 inch depth, includes equipment and labor for trenching and backfilling.	Feet	$3.76	105	$394.80
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	12	$344.52
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	20	$607.20
Materials						
Pipe, HDPE, corrugated single wall, <= 12 in. weight priced Compound	1380	High Density Polyethylene (HDPE) compound manufactured into single wall corrugated pipe or tubing. Materials only.	Pound	$2.09	22.8	$47.65
Water Control Structure, Stoplog, Inline, fixed costs portion	2145	Fixed cost portion of Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Materials only.	Each	$367.01	2	$734.02
Water Control Structure, Stoplog, Inline, variable cost portion	2146	Variable cost portion of a Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Calculate total variable costs by multiplying by the structure height x pipe diameter. Materials only.	Height x Diameter	$18.68	120	$2,241.60
Pipe, HDPE, corrugated double wall, <= 12-inch, watertight, weight priced	2816	High Density Polyethylene (HDPE) compound manufactured into double wall corrugated pipe <= 12-inch diameter. Materials only.	Pound	$3.72	231	$859.32
Mobilization						

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	4	$3,058.52

Practice: 605 - Denitrifying Bioreactor

Scenario: #22 - Bioreactor With Soil Cover with Automated WCS

Scenario Description:

This practice is installed at the outlet of a subsurface drainage system. The water passes through a structure (with overflow bypass) which disperses it through a volume of woodchips (or equivalent material as supported by research) where the nitrogen is converted such that the discharged water has a reduced level of nitrogen compared to the initial inflow. Typical trench size is 15' wide x 100' long x 5' deep. A typical installation consists of an automated control structure used to control inflow into and bypass flow around the structure and a second automated water control structure is used to control outflow from the bioreactor. The bioreactor has geotextile fabric lining the trench and between the wood chips and the soil cover. Typical components include: woodchip filled pit, a soil cover, two automated water control structures each with one baffle, and piping to convey water to and from the bioreactor. Woodchips serve as the carbon source necessary to the denitrification process. 20% settling of wood chips may occur but volume based on neat line in drawings. The automated water control structures should meet the requirement of Practice Standard 587 Structure for Water Control. Associated practices: Subsurface Drain (606), Drainage Water Management (554). Resource concern: Water Quality Degradation - Excess nutrients in surface and ground waters. Management and maintenance of the bioreactor (including chip replenishment), as well as monitoring and reporting to demonstrate the performance of the practice are not included in this scenario.

Before Situation:

Before the installation, the subsurface drainage system is contributing nitrates to a surface water source (ditch or stream), high nitrates are a resource concern to the receiving water, and it is feasible to install a bioreactor to reduce the nitrate load from drainage outflows.

After Situation:

Water is detained in a bioreactor where bacteria break down nitrogen such that it is not discharged to surface waters. All components of the bioreactor are installed and functional. Nitrates are removed from bioreactor outflow. The approximate bioreactor excavated pit volume is 280 cubic yards (e.g. 5 feet deep, 15 feet wide and 100 feet long). Woodchips occupy the lower ~3.5 feet of the pit (200 cu. yd.) and a soil blanket over the woodchips is mounded 1.0 ft. above the surrounding ground surface to shed water and account for settling. One inline automated water control structure with one baffle is used for inlet and bypass flow and a second inline automated water control structure with one baffle is used for outlet flow. The automated water control structures are connected to the two 6' diameter HDPE dual-wall manifold pipes by 10' diameter dual wall pipe. Flow rates are dependent upon the availability of drainage water from the 10' drainage mainline. The soil excavated from the pit is spoiled onto the nearby field.

Feature Measure: Volume of Carbon Source

Scenario Unit: Cubic Yards

Scenario Typical Size: 200.00

Scenario Total Cost: $28,459.71

Scenario Cost/Unit: $142.30

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.11	780	$865.80
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	280	$705.60
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.45	140	$483.00
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$56.88	26	$1,478.88
Aggregate, Wood Chips	1098	Includes materials, equipment and labor to transport and place.	Cubic Yards	$50.92	200	$10,184.00
Trenching, Earth, 24 in. x 60 in.	1460	Trenching, earth, 24 inch wide x 60 inch depth, includes equipment and labor for trenching and backfilling.	Feet	$3.76	105	$394.80
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	6	$263.22
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	12	$344.52
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	26	$789.36
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	4	$194.40
Materials						
Switches and Controls, programmable controller	1193	Programmable logic controller (with or without wireless telecommunications) commonly used to control pumps and irrigation systems	Each	$623.08	2	$1,246.16

Pipe, HDPE, corrugated single wall, <= 12 in. weight priced Compound	1380	High Density Polyethylene (HDPE) compound manufactured into single wall corrugated pipe or tubing. Materials only.	Pound	$2.09	22.8	$47.65
Data Logger with Telemetry System	1454	Data Logger W/Graphic Output for water management and telemetry - data communication device with power supply in a weather proof enclosure. Equipment only.	Each	$1,663.47	2	$3,326.94
Water Control Structure, Stoplog, Inline, fixed costs portion	2145	Fixed cost portion of Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Materials only.	Each	$367.01	2	$734.02
Water Control Structure, Stoplog, Inline, variable cost portion	2146	Variable cost portion of a Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Calculate total variable costs by multiplying by the structure height x pipe diameter. Materials only.	Height x Diameter	$18.68	120	$2,241.60
Valve, Inline, < 12 inch dia.	2367	Inline valve less than 12 inch diameter to control direction and volume of flow within a pipeline system. Materials only.	Each	$468.77	2	$937.54
Light Duty Linear Actuator	2724	12VDC aluminum light duty linear actuator with 12??? stroke and potentiometer. 110 lb dynamic load rating with 20:1 gear ratio, 500 lb static load rating.	Each	$152.19	2	$304.38
Pipe, HDPE, corrugated double wall, <= 12-inch, watertight, weight priced	2816	High Density Polyethylene (HDPE) compound manufactured into double wall corrugated pipe <= 12-inch diameter. Materials only.	Pound	$3.72	231	$859.32
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	4	$3,058.52

Practice: 605 - Denitrifying Bioreactor

Scenario: #24 - Bioreactor Without Soil Cover with Automated WCS

Scenario Description:

This practice is installed at the outlet of a subsurface drainage system. The water passes through a structure (with overflow bypass) which disperses it through a volume of woodchips (or equivalent material as supported by research) where the nitrogen is converted such that the discharged water has a reduced level of nitrogen compared to the initial inflow. Typical trench size is 15' wide x 100' long x 5' deep. A typical installation consists of an automated control structure used to control inflow into and bypass flow around the structure and a second automated water control structure is used to control outflow from the bioreactor. The bioreactor has geotextile fabric lining the bottom and sides of the trench. Typical components include: woodchip filled pit,, two automated water control structures each with one baffle, and piping to convey water to and from the bioreactor. Woodchips serve as the carbon source necessary to the denitrification process. 20% settling of wood chips may occur but volume based on neat line in drawings. The automated water control structures should meet the requirement of Practice Standard 587 Structure for Water Control. Associated practices: Subsurface Drain (606), Drainage Water Management (554). Resource concern: Water Quality Degradation - Excess nutrients in surface and ground waters. Management and maintenance of the bioreactor (including chip replenishment), as well as monitoring and reporting to demonstrate the performance of the practice are not included in this scenario..

Before Situation:

Before the installation, the subsurface drainage system is contributing nitrates to a surface water source (ditch or stream), high nitrates are a resource concern to the receiving water, and it is feasible to install a bioreactor to reduce the nitrate load from drainage outflows.

After Situation:

Water is detained in a bioreactor where bacteria break down nitrogen such that it is not discharged to surface waters. All components of the bioreactor are installed and functional. Nitrates are removed from bioreactor outflow. The approximate bioreactor excavated pit volume is 280 cubic yards (e.g. 5 feet deep, 15 feet wide and 100 feet long). Woodchips occupy the entire pit and are mounded 1.0 ft. above the surrounding ground surface to shed water and account for settling. One inline automated water control structure with one baffle is used for inlet and bypass flow and a second inline automated water control structure with one baffle is used for outlet flow. The automated water control structures are connected to the two 6' diameter HDPE dual-wall manifold pipes by 10' diameter dual wall pipe. Flow rates are dependent upon the availability of drainage water from the 10' drainage mainline. The soil excavated from the pit is spoiled onto the nearby field.

Feature Measure: Volume of Carbon Source

Scenario Unit: Cubic Yards

Scenario Typical Size: 340.00

Scenario Total Cost: $35,203.97

Scenario Cost/Unit: $103.54

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.11	470	$521.70
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	280	$705.60
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.45	280	$966.00
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$56.88	20	$1,137.60
Aggregate, Wood Chips	1098	Includes materials, equipment and labor to transport and place.	Cubic Yards	$50.92	340	$17,312.80
Trenching, Earth, 24 in. x 60 in.	1460	Trenching, earth, 24 inch wide x 60 inch depth, includes equipment and labor for trenching and backfilling.	Feet	$3.76	105	$394.80
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	6	$263.22
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	12	$344.52
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	20	$607.20
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	4	$194.40
Materials						
Switches and Controls, programmable controller	1193	Programmable logic controller (with or without wireless telecommunications) commonly used to control pumps and irrigation systems	Each	$623.08	2	$1,246.16

Pipe, HDPE, corrugated single wall, <= 12 in. weight priced Compound	1380	High Density Polyethylene (HDPE) compound manufactured into single wall corrugated pipe or tubing. Materials only.	Pound	$2.09	22.8	$47.65
Data Logger with Telemetry System	1454	Data Logger W/Graphic Output for water management and telemetry - data communication device with power supply in a weather proof enclosure. Equipment only.	Each	$1,663.47	2	$3,326.94
Water Control Structure, Stoplog, Inline, fixed costs portion	2145	Fixed cost portion of Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Materials only.	Each	$367.01	2	$734.02
Water Control Structure, Stoplog, Inline, variable cost portion	2146	Variable cost portion of a Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Calculate total variable costs by multiplying by the structure height x pipe diameter. Materials only.	Height x Diameter	$18.68	120	$2,241.60
Valve, Inline, < 12 inch dia.	2367	Inline valve less than 12 inch diameter to control direction and volume of flow within a pipeline system. Materials only.	Each	$468.77	2	$937.54
Light Duty Linear Actuator	2724	12VDC aluminum light duty linear actuator with 12??? stroke and potentiometer. 110 lb dynamic load rating with 20:1 gear ratio, 500 lb static load rating.	Each	$152.19	2	$304.38
Pipe, HDPE, corrugated double wall, <= 12-inch, watertight, weight priced	2816	High Density Polyethylene (HDPE) compound manufactured into double wall corrugated pipe <= 12-inch diameter. Materials only.	Pound	$3.72	231	$859.32
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	4	$3,058.52

Practice: 606 - Subsurface Drain

Scenario: #1 - Corrugated Plastic Pipe (CPP), Single-Wall, less than or equal to 6 inch

Scenario Description:

Description: Below ground installation of perforated HDPE (Corrugated Plastic Pipe) pipeline, using a drainage plow or trenching machine. HDPE (CPP) Single-Wall is manufactured in sizes (nominal diameter) from 3-inch to 24-inch; typical practice sizes range from 3-inch to 12-inch; and typical scenario size is 5-inch. Construct 2,000 feet of 5-inch, Single-Wall, perforated HDPE Corrugated Plastic Pipe (CPP), installed below ground to a minimum depth 3 to 5 feet. The unit is in linear feet of pipe. The typical number of mainline connections for 2,000 feet of subsurface drainline is a total of 3 each. Resource Concerns: Excess Water (Seasonal High Water Table); Degraded Plant Condition; Water Quality Degradation (Nutrients). Associated Practices: 608 - Surface Drain, Main or Lateral; 587 - Structure for Water Control, 533 - Pumping Plant; and 554 - Drainage Water Management, 342 - Critical Area Planting.

Before Situation:

Before installation soil conditions are excessively wet in the spring due to poor internal soil drainage. Saturated soils inhibits vegetative cover or adversely effects soil engineering properties impacting the performance of the associated practice.

After Situation:

The drainage modifications result in vegetation establishment and the required soil engineering properties are achieved to enable the construction and operation of the associated practices or drainage water management.

Feature Measure: Length of Pipe

Scenario Unit: Linear Feet

Scenario Typical Size: 2,000.00

Scenario Total Cost: $9,448.02

Scenario Cost/Unit: $4.72

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	6	$397.08
Trenching, tile line plowing, earth, 60 in.	1457	Plowing in 3 -15 inch CPP drain line into earth, 60 inch depth, includes equipment and labor for trenching, laying, and backfilling.	Feet	$2.47	2000	$4,940.00
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	6	$240.78
Materials						
Pipe, HDPE, corrugated single wall, <= 12 in. weight priced Compound	1380	High Density Polyethylene (HDPE) compound manufactured into single wall corrugated pipe or tubing. Materials only.	Pound	$2.09	1000	$2,090.00
Drainage Lateral Connection	1458	Connect 3-6 inch drainage lateral to main drain, includes excavation to 6 foot depth, install tee on main line, connect lateral, and backfill. Includes material cost for tee.	Each	$30.78	3	$92.34
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 606 - Subsurface Drain

Scenario: #2 - Enveloped Corrugated Plastic Pipe (CPP), Single-Wall, less than or equal to 6 inch

Scenario Description:

Description: Below ground installation of perforated HDPE (Corrugated Plastic Pipe) pipeline with Sand-Gravel envelope, using a drainage trencher. HDPE (CPP) Single-Wall is manufactured in sizes (nominal diameter) from 3-inch to 24-inch; typical practice sizes range from 3-inch to 12-inch; and typical scenario size is 5-inch. Construct 2,000 feet of 5-inch, Single-Wall, perforated HDPE Corrugated Plastic Pipe (CPP), installed below ground to a minimum depth of 5 feet, and surrounded with a sand-gravel envelope. The unit is in linear feet of pipe. The typical volume sand-gravel for 2,000 feet of 12'wide x 12' high envelope is 64 cubic yards. The typical number of mainline connections for 2,000 feet of subsurface drainline is a total of 3 each. Resource Concerns: Excess Water (seasonal High Water Table); Degraded Plant Condition; Water Quality Degradation (Nutrients). Associated Practices: 608 - Surface Drain, Main or Lateral; 587 - Structure for Water Control, 533 - Pumping Plant; and 554 - Drainage Water Management.

Before Situation:

Before installation soil conditions are excessively wet in the spring due to poor internal soil drainage. Saturated soils inhibits vegetative cover or adversely effects soil engineering properties impacting the performance of the associated practice

After Situation:

The drainage modifications result in vegetation establishment and the required soil engineering properties are achieved to enable the construction and operation of the associated practices or improved drainage water quality due to system retrofit enabling drainage water management.

Feature Measure: Length of Pipe

Scenario Unit: Linear Feet

Scenario Typical Size: 2,000.00

Scenario Total Cost: $12,153.21

Scenario Cost/Unit: $6.08

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	6	$397.08
Track Loader, 95HP	935	Equipment and power unit costs. Labor not included.	Hours	$97.06	8	$776.48
Trenching, Earth, 12 in. x 60 in.	1459	Trenching, earth, 12 inch wide x 60 inch depth, includes equipment and labor for trenching, laying 3 to 6 inch CPP drain line with envelope, and backfilling.	Feet	$1.92	2000	$3,840.00
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	14	$561.82
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	64	$1,943.04
Pipe, HDPE, corrugated single wall, <= 12 in. weight priced Compound	1380	High Density Polyethylene (HDPE) compound manufactured into single wall corrugated pipe or tubing. Materials only.	Pound	$2.09	1000	$2,090.00
Drainage Lateral Connection	1458	Connect 3-6 inch drainage lateral to main drain, includes excavation to 6 foot depth, install tee on main line, connect lateral, and backfill. Includes material cost for tee.	Each	$30.78	3	$92.34
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 606 - Subsurface Drain

Scenario: #3 - Corrugated Plastic Pipe (CPP), Single-Wall, greater than or equal to 8 inches

Scenario Description:

Description: Below ground installation of HDPE (Corrugated Plastic Pipe) pipeline, using a drainage plow. HDPE (CPP) Single-Wall is manufactured in sizes (nominal diameter) from 3-inch to 24-inch; typical practice sizes range from 3-inch to 12-inch; and typical scenario size is 10-inch. Construct 1,000 feet of 10-inch, Single-Wall, HDPE Corrugated Plastic Pipe (CPP), installed below ground to a minimum depth 5 feet. The unit is in linear feet of pipe. The typical number of mainline connections for 1,000 feet of subsurface drainline is a total of 2 each.Resource Concerns: Excess Water (Seasonal High Water Table); Degraded Plant Condition; Water Quality Degradation (Nutrients). Associated Practices: 607 - Surface Drain, Field Ditch; 608 - Surface Drain, Main or Lateral; 587 - Structure for Water Control, 533 - Pumping Plant; and 554 - Drainage Water Management, 342 - Critical Area Planting.

Before Situation:

Before installation soil conditions are excessively wet in the spring due to poor internal soil drainage. Saturated soils inhibits vegetative cover or adversely effects soil engineering properties impacting the performance of the associated practice

After Situation:

The drainage modifications result in vegetation establishment and the required soil engineering properties are achieved to enable the construction and operation of the associated practices or improved drainage water quality due to system retrofit enabling drainage water management.

Feature Measure: Length of Pipe

Scenario Unit: Linear Feet

Scenario Typical Size: 1,000.00

Scenario Total Cost: $8,406.62

Scenario Cost/Unit: $8.41

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	4	$264.72
Trenching, tile line plowing, earth, 60 in.	1457	Plowing in 3 -15 inch CPP drain line into earth, 60 inch depth, includes equipment and labor for trenching, laying, and backfilling.	Feet	$2.47	1000	$2,470.00
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	4	$160.52
Materials						
Pipe, HDPE, corrugated single wall, <= 12 in. weight priced Compound	1380	High Density Polyethylene (HDPE) compound manufactured into single wall corrugated pipe or tubing. Materials only.	Pound	$2.09	1800	$3,762.00
Drainage Lateral Connection	1458	Connect 3-6 inch drainage lateral to main drain, includes excavation to 6 foot depth, install tee on main line, connect lateral, and backfill. Includes material cost for tee.	Each	$30.78	2	$61.56
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 606 - Subsurface Drain

Scenario: #4 - Corrugated Plastic Pipe (CPP), Twin-Wall, greater than or equal to 8 inches

Scenario Description:

Description: Below ground installation of HDPE (Corrugated Plastic Pipe) pipeline, using a drainage plow. HDPE (CPP) Twin-Wall is manufactured in sizes (nominal diameter) from 4-inch to 60-inch; typical practice sizes range from 8-inch to 15-inch; and typical scenario size is 12-inch. Construct 1,000 feet of 12-inch, Twin-Wall, HDPE Corrugated Plastic Pipe (CPP), installed below ground to a minimum depth 5 feet. The unit is in linear feet of pipe. Resource Concerns: Excess Water (Seasonal High Water Table); Degraded Plant Condition; Water Quality Degradation (Nutrients). Associated Practices: 607 - Surface Drain, Field Ditch; 608 - Surface Drain, Main or Lateral; 587 - Structure for Water Control, 533 - Pumping Plant; and 554 - Drainage Water Management, 342 - Critical Area Planting.

Before Situation:

Before installation soil conditions are excessively wet in the spring due to poor internal soil drainage. Saturated soils inhibits vegetative cover or adversely effects soil engineering properties impacting the performance of the associated practice

After Situation:

The drainage modifications result in vegetation establishment and the required soil engineering properties are achieved to enable the construction and operation of the associated practices or improved drainage water quality due to system retrofit enabling drainage water management.

Feature Measure: Length of Pipe

Scenario Unit: Linear Feet

Scenario Typical Size: 1,000.00

Scenario Total Cost: $17,692.06

Scenario Cost/Unit: $17.69

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	4	$264.72
Trenching, Earth, 24 in. x 60 in.	1460	Trenching, earth, 24 inch wide x 60 inch depth, includes equipment and labor for trenching and backfilling.	Feet	$3.76	1000	$3,760.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	64	$1,837.44
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	4	$160.52
Materials						
Drainage Lateral Connection	1458	Connect 3-6 inch drainage lateral to main drain, includes excavation to 6 foot depth, install tee on main line, connect lateral, and backfill. Includes material cost for tee.	Each	$30.78	2	$61.56
Pipe, HDPE, corrugated double wall, LTE-12 in., soil tight, weight priced	1587	High Density Polyethylene (HDPE) compound manufactured into double wall corrugated pipe LTE-12 inch diameter. Materials only.	Pound	$3.10	3200	$9,920.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 606 - Subsurface Drain

Scenario: #5 - Structural Practice Support Drain

Scenario Description:

Subsurface drainage is installed to facilitate the construction and operation of an associated structural practice. Construct 1,000 feet of 5-inch, single-wall, HDPE Corrugated Plastic Pipe (CPP), install below ground to a depth of 3 feet. The unit is in lineal feet.Associated Practices: Diversion (362), Grade Stabilization Structure (410), Grassed Waterway (412), Pond (378), Terrace (600), Waste Storage Facility (313), Water and Sediment Control Basin (638), Water and Sediment Control Basin (638), Underground Outlet (620), Critical Area Seeding (342)

Before Situation:

Without the subsurface drain installation, soil wetness inhibites vegetative cover or adversely effects soil engineering properties impacting the performance of the associated practice.

After Situation:

With the subsurface drainage in place vegetation is established and maintained and the required soil engineering properties are achieved to enable the construction and operation of the associated practice.

Feature Measure: Length of Subsurface drain

Scenario Unit: Feet

Scenario Typical Size: 1,000.00

Scenario Total Cost: $5,521.75

Scenario Cost/Unit: $5.52

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	3	$198.54
Trenching, tile line plowing, earth, 60 in.	1457	Plowing in 3 -15 inch CPP drain line into earth, 60 inch depth, includes equipment and labor for trenching, laying, and backfilling.	Feet	$2.47	1000	$2,470.00
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	3	$120.39
Materials						
Pipe, HDPE, corrugated single wall, <= 12 in. weight priced Compound	1380	High Density Polyethylene (HDPE) compound manufactured into single wall corrugated pipe or tubing. Materials only.	Pound	$2.09	500	$1,045.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 606 - Subsurface Drain

Scenario: #6 - Waste Storage Facility Perimeter Drain, 9 or less feet deep

Scenario Description:

A subsurface drainage system is required to construct and operate an aquaculture pond or waste storage facility.Subsurface drainage system consists of a trench with sloped side slopes, installed <9 ft below the ground surface and 2 ft below the planned waste storage facility bottom elevation on the outside of the pond footprint. Granular drain material is placed on one of the sloped trench slopes for approximately 9 ft, encasing a 6' HDPW CPT at the bottom.The measured length is the length of tubing installed. The installation of this practice prevents excess inclusion of groundwater into the structure affecting its operational capacity and the potential damage of side slopes and liners which may cause excess nutrient loading from stored contents seeping into groundwater.Associated Practices include: Anaerobic Digester (366), Pumping Plant (533), Waste Storage Facility (313), Waste Transfer (634)

Before Situation:

Before installation soil conditions are excessively wet in the spring due to poor internal soil drainage. Excess soil water is preventing proper storage and handling of livestock operations wastewater and manure.

After Situation:

The drainage modifications result in reduced soil profile wetness caused by a seasonal high water table. The waste storage facility bottom dimensions are 100x200 ft. The wsf depth is 7 ft below the ground surface. 920 ft of perforated 6' HDPE pipe is place around the perimeter of the WSF. The drain is attached to an underground outlet or pump station to provide an adequate outlet.

Feature Measure: Corrugated Platic Tubing

Scenario Unit: Feet

Scenario Typical Size: 920.00

Scenario Total Cost: $34,936.82

Scenario Cost/Unit: $37.97

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hours	$145.01	31	$4,495.31
Track Loader, 95HP	935	Equipment and power unit costs. Labor not included.	Hours	$97.06	20	$1,941.20
Compaction, earthfill, vibratory plate	1260	Compaction of earthfill with a walk behind vibratory plate compactor in typical 6-8 inch thick lifts, 2 passes. Includes equipment and labor.	Cubic Yards	$2.80	613	$1,716.40
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	31	$890.01
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	51	$2,046.63
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	443	$12,784.98
Pipe, HDPE, corrugated single wall, <= 12 in. weight priced Compound	1380	High Density Polyethylene (HDPE) compound manufactured into single wall corrugated pipe or tubing. Materials only.	Pound	$2.09	699.2	$1,461.33
Drainage Lateral Connection	1458	Connect 3-6 inch drainage lateral to main drain, includes excavation to 6 foot depth, install tee on main line, connect lateral, and backfill. Includes material cost for tee.	Each	$30.78	1	$30.78
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	2	$1,846.38
Aggregate, Shipping, Cubic Yard-mile	2360	Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul).	Cubic Yard Mile	$0.42	18390	$7,723.80

Practice: 606 - Subsurface Drain

Scenario: #7 - Waste Storage Facility Perimeter Drain, greater than 9 feet deep

Scenario Description:

A subsurface drainage system is required to construct and operate an aquaculture pond or waste storage facility.Subsurface drainage system consists of a trench with sloped side slopes constructed outside the footprint of the pond, installed over 9 ft below the ground surface (typical 13') and 2 ft below the planned waste storage facility bottom elevation. 12' thick granular drain material is placed on one of the sloped trench slopes for approximately 18 ft ,encasing a 6' HDPE CPT at the bottom.The measured length is the length of tubing installed. The installation of this practice prevents excess inclusion of groundwater into the structure affecting its operational capacity and the potential damage of side slopes and liners which may cause excess nutrient loading from stored contents seeping into groundwater.Associated Practices include: Anaerobic Digester (366), Pumping Plant (533), Waste Storage Facility (313), Waste Transfer (634)

Before Situation:

Before installation soil conditions are excessively wet in the spring due to poor internal soil drainage. Excess soil water is preventing proper storage and handling of livestock operations wastewater and manure.

After Situation:

The drainage modifications result in reduced soil profile wetness caused by a seasonal high water table. The waste storage facility bottom dimensions are 100x200 ft. The wsf depth is 11 ft below the ground surface. 920 ft of perforated 6' HDPE pipe is placed around the perimeter of the WSF. The drain is attached to an underground outlet or pump station to provide an adequate outlet.

Feature Measure: Corrugated Platic Tubing

Scenario Unit: Feet

Scenario Typical Size: 920.00

Scenario Total Cost: $44,422.67

Scenario Cost/Unit: $48.29

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hours	$145.01	46	$6,670.46
Track Loader, 95HP	935	Equipment and power unit costs. Labor not included.	Hours	$97.06	30	$2,911.80
Compaction, earthfill, vibratory plate	1260	Compaction of earthfill with a walk behind vibratory plate compactor in typical 6-8 inch thick lifts, 2 passes. Includes equipment and labor.	Cubic Yards	$2.80	613	$1,716.40
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	46	$1,320.66
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	76	$3,049.88
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	613	$17,691.18
Pipe, HDPE, corrugated single wall, <= 12 in. weight priced Compound	1380	High Density Polyethylene (HDPE) compound manufactured into single wall corrugated pipe or tubing. Materials only.	Pound	$2.09	699.2	$1,461.33
Drainage Lateral Connection	1458	Connect 3-6 inch drainage lateral to main drain, includes excavation to 6 foot depth, install tee on main line, connect lateral, and backfill. Includes material cost for tee.	Each	$30.78	1	$30.78
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	2	$1,846.38
Aggregate, Shipping, Cubic Yard-mile	2360	Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul).	Cubic Yard Mile	$0.42	18390	$7,723.80

Practice: 606 - Subsurface Drain

Scenario: #8 - Waste Storage Facility Underdrain

Scenario Description:

A subsurface drainage system is required below the floor of the structure to construct and operate an aquaculture pond or waste storage facility.Subsurface drainage system consists of a shallow vertical trench with a sand encased tile below the planned waste storage facility floor. Typical installation is a 2 ft trench with a 6' perforated tile encased in sand. Tile will be placed around the entire Floor/slope interface with 2 additional lines through the center, connected to the outside line.The measured length is the length of tubing installed. The installation of this practice prevents excess inclusion of groundwater into the structure affecting its operational capacity and the potential damage of liners which may cause excess nutrient loading from stored contents seeping into groundwater.Associated Practices include: Anaerobic Digester (366), Pumping Plant (533), Waste Storage Facility (313), Waste Transfer (634)

Before Situation:

Before installation soil conditions are excessively wet in the spring due to poor internal soil drainage. Excess soil water is preventing proper storage and handling of livestock operations wastewater and manure.

After Situation:

The drainage modifications result in reduced soil profile wetness caused by a perched water table. The waste storage facility bottom dimensions are 100x200 ft. The wsf depth is 8 ft below the ground surface. 1000 ft of perforated 6' HDPE pipe is placed around the perimeter of the bottom of the WSF with 2 lines in the middle. The drain is directed to a suitable outlet.

Feature Measure: Corrugated Platic Tubing

Scenario Unit: Feet

Scenario Typical Size: 1,000.00

Scenario Total Cost: $19,116.83

Scenario Cost/Unit: $19.12

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hours	$145.01	25	$3,625.25
Track Loader, 95HP	935	Equipment and power unit costs. Labor not included.	Hours	$97.06	20	$1,941.20
Compaction, earthfill, vibratory plate	1260	Compaction of earthfill with a walk behind vibratory plate compactor in typical 6-8 inch thick lifts, 2 passes. Includes equipment and labor.	Cubic Yards	$2.80	148	$414.40
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	50	$1,435.50
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	50	$2,006.50
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	148	$4,271.28
Pipe, HDPE, corrugated single wall, <= 12 in. weight priced Compound	1380	High Density Polyethylene (HDPE) compound manufactured into single wall corrugated pipe or tubing. Materials only.	Pound	$2.09	760	$1,588.40
Drainage Lateral Connection	1458	Connect 3-6 inch drainage lateral to main drain, includes excavation to 6 foot depth, install tee on main line, connect lateral, and backfill. Includes material cost for tee.	Each	$30.78	4	$123.12
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	2	$1,846.38
Aggregate, Shipping, Cubic Yard-mile	2360	Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul).	Cubic Yard Mile	$0.42	4440	$1,864.80

Practice: 606 - Subsurface Drain

Scenario: #9 - Secondary Main Retrofit for DWM

Scenario Description:

An agricultural field has existing patterned tile system installed at 75 foot spacings. The field is 75 acres in size: 2475' x 1320', with a single main line at the low end of the field (2475'). The laterals are installed perpendicular to the topographic contours. The field has 3.5 feet of fall in the 1/4 mile length of the laterals, so a secondary main will be needed to allow drainage water management to be implemented on the higher half of the field.

Before Situation:

The patterned tile drainage system allows free flow of drainage water to a receiving ditch. Drainage water carries nitrogen and phosphorus out of the soil and these nutrients pollute the receiving waters.

After Situation:

A 12 inch diameter secondary mainline is retrofitted to the drainage system, located halfway up the field and relatively parallel to the topographic contours. This new mainline is hooked to each individual lateral and continued to a stable outlet. A Drainage Water practice must be completed along with the mainline; typically Structures for Water Control (587) installed at two foot vertical intervals so that water can be retained in the field. This scenario also applies to systems where the secondary main is used to connect drain lines that formerly each exited separately to the ditch, with a structure that distributes the drainage water into the subsurface soil at a Saturated Buffer (604) OR a Denitrifying Bioreactor (605) might be installed at the outlet. In combination or singly, one of these practices must be installed with the secondary main.

Feature Measure: Feet of new mainline tile

Scenario Unit: Feet

Scenario Typical Size: 3,135.00

Scenario Total Cost: $26,916.50

Scenario Cost/Unit: $8.59

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trenching, tile line plowing, earth, 60 in.	1457	Plowing in 3 -15 inch CPP drain line into earth, 60 inch depth, includes equipment and labor for trenching, laying, and backfilling.	Feet	$2.47	3135	$7,743.45
Materials						
Pipe, HDPE, corrugated single wall, <= 12 in. weight priced Compound	1380	High Density Polyethylene (HDPE) compound manufactured into single wall corrugated pipe or tubing. Materials only.	Pound	$2.09	8260.72	$17,264.90
Drainage Lateral Connection	1458	Connect 3-6 inch drainage lateral to main drain, includes excavation to 6 foot depth, install tee on main line, connect lateral, and backfill. Includes material cost for tee.	Each	$30.78	32	$984.96
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 609 - Surface Roughening

Scenario: #5 - Tillage with Wind Erodibility factor (I) greater than 104

Scenario Description:
Emergency Tillage on soils that are stable enough to sustain effective ridges and cloddiness and have a high wind erosion potential due to lack of surface cover.

Before Situation:
Current well-planned and properly applied wind erosion control systems have failed. Tillage operations have not effectively reduced soil erosion from wind and wind-borne sediment, Particulate Matter emissions occur. Crop damage from wind-borne particles can occur.

After Situation:
Emergency Tillage has been conducted to produce random roughness (RR) values large enough to achieve a 25% reduction in the potential erosion rate, or reduced wind erosion during the management period by 25%.

Feature Measure: Acres of Surface Roughening

Scenario Unit: Acres

Scenario Typical Size: 160.00

Scenario Total Cost: $4,263.60

Scenario Cost/Unit: $26.65

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Ripper or subsoiler, 16 to 36 inch depth	1235	Deep ripper or subsoiler, (16-36 inches depth) includes tillage implement, power unit and labor.	Acres	$23.61	160	$3,777.60
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	10	$486.00

Practice: 609 - Surface Roughening

Scenario: #6 - Tillage for Random Surface Roughness

Scenario Description:
Emergency Tillage on soils that are stable enough to sustain effective ridges and cloddiness and have a high wind erosion potential due to lack of surface cover. Wind erodibility factor (I) is less than 104.

Before Situation:
Current well -planned and properly applied wind erosion control systems have failed. Tillage operations have not effectively reduced soil erosion from wind and wind-borne sediment, Particulate Matter emissions occur. Crop damage from wind-borne particles can occur.

After Situation:
Emergency Tillage has been conducted to produce random roughness (RR) values large enough to achieve a 25% reduction in the potential erosion rate, or reduced wind erosion during the management period by 25%.

Feature Measure: Acres of Surface Roughening

Scenario Unit: Acres

Scenario Typical Size: 160.00

Scenario Total Cost: $4,103.60

Scenario Cost/Unit: $25.65

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acres	$22.61	160	$3,617.60
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	10	$486.00

Practice: 610 - Salinity and Sodic Soil Management

Scenario: #7 - Soil Management (Irrigated)

Scenario Description:

'The producer secures training in Salinity and Sodic Soil Management and develops and carries out a Salinity and Sodic Soil Management Plan. Scenario includes cost of attending a 6 hours University, NRCS, or commodity group sponsored training session and 40 hours of management labor a year to analyze available data and field situation, develop (or review and modify as necessary) plan and carry it out. Sampling on a 3-5 year interval is recommended if conditional soils are irrigated or marginal irrigation water is used.. Monitor (sample) one site per 40 acres of each major soil. Monitoring procedures include; GPS reference all sites, duplicate (2 samples) all sites of each major soil, sample after harvest, sampled to a depth of 6 feet and examined to 10 feet noting water table depth. Also sample each genetic soil horizon or portion no greater than 12 inches. Monitoring should be done by or under the supervision of an experienced soil scientist.Resource Concerns: Soil Quality Degradation - Concentration of salts or other chemicals, and Water Quality Degradation- Excessive salts in surface and ground waters.Associated Practices: 328-Conservation Crop Rotation; 449-Irrigation Water Management; and 590-Nutrient Management.'

Before Situation:

Salinity and or Sodic conditions have developed in the root zone of a 100 acre irrigated cropland field resulting in decreased soil quality, plant health problems, and yield reductions.

After Situation:

Producer conducts soil conductivity and salinity test to determine the root zone depth of water application necessary for flushing accumulated salts and maintaining a proper salt balance. Producer conducts irrigation suitability test of water supply results to determine suitability of applied water for irrigation and additional irrigation volumes needed for leaching. Routine periodic checks of water EC will be conducted by producer to monitor for water salinity which might require changes to Salinity and Sodic Soil Management Plan. The Salinity and Sodic Soil Management Plan is carried out employing soil and water testing and as applicable changes in Irrigation Water Management (449), Conservation Crop Rotation (328), tillage, and use of soil amendments. The producer has developed and is carrying out a Salinity and Sodic Soil Management Plan resulting in improved soil quality and plant health.

Feature Measure: Acres included in Salinity and Sodic

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $3,791.63

Scenario Cost/Unit: $37.92

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.39	1	$116.39
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	40	$1,944.00
Materials						
Test, Standard Water Test, Irrigation Suitability	310	Irrigation water suitability lab analysis. Includes pH, alkalinity, carbonates/bicarbonates, EC, dissolved solids, B, Cl, Ca, Mg, Na, SAR, and hardness.	Each	$56.80	1	$56.80
Testing, soil sampling and EC analysis, bore hole	2055	Collecting and testing 5 soil samples per 60 inch bore hole. Inclueds EC measurements. Includes equipment and labor.	Hours	$418.61	4	$1,674.44

Practice: 610 - Salinity and Sodic Soil Management

Scenario: #8 - Soil Management (non-Irrigated)

Scenario Description:

The producer secures training in Salinity and Sodic Soil Management, analyzes subsurface conditions in areas in and around a saline seep and using information gained from training and field observations carries out a Salinity and Sodic Soil Management Plan employing as applicable changes in Conservation Cropping Systems, Critical Area Planting, Nutrient Management and use of soil amendments. Scenario includes cost of attending a 6 hr. University, NRCS, or commodity group sponsored training session and 40 hours of management labor a year to analyze available data and field situation, then review, and modify as necessary the Salinity and Sodic Soil Management Plan and continue to carry it out. Resource Concerns: Soil Quality Degradation - Concentration of salts or other chemicals, and Water Quality Degradation- Excessive salts in surface and ground waters. Associated Practices: 328 -Conservation Cropping System; 342- Critical Area Planting; and 590 - Nutrient Management. '

Before Situation:

A crop-fallow system on sodic and saline soils has resulted in saline seeps. The recharge area of the seep must be determined before the extents of the treatment can be planned. An analyses of the subsurface conditions in areas in and around a saline is completed on 95 acres of recharge area surrounding a 5 acre saline seep in order to determine groundwater gradients and limits of the recharge area.

After Situation:

A determination of extent of recharge area has been made. The area to be treated has been identified. The producer has developed and is carrying out a Salinity and Sodic Soil Management Plan. Deep percolation in the recharge area is eliminated and salts no longer leach into the ground or surface water.

Feature Measure: Acres included in Salinity and Sodic

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $2,060.39

Scenario Cost/Unit: $20.60

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.39	1	$116.39
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	40	$1,944.00

Practice: 610 - Salinity and Sodic Soil Management

Scenario: #9 - Soil Management (non-Irrigated) (FI - 1 Yr)

Scenario Description:

'The producer secures training in Salinity and Sodic Soil Management, analyzes subsurface conditions in areas in and around a saline seep and using information gained from training and field observations carry's out a Salinity and Sodic Soil Management Plan employing as applicable changes in Conservation Cropping Systems, Critical Area Planting, Nutrient Management and use of soil amendments. Scenario includes cost of attending a 6 hr. University, NRCS, or commodity group sponsored training session and 40 hours of management labor a year to analyze available data and field situation, then review, and modify as necessary the Salinity and Sodic Soil Management Plan and continue to carry it out. Resource Concerns: Soil Quality Degradation - Concentration of salts or other chemicals, and Water Quality Degradation- Excessive salts in surface and ground waters. Associated Practices: 328 -Conservation Cropping System; 342- Critical Area Planting; and 590 - Nutrient Management. '

Before Situation:

A crop-fallow system on sodic and saline soils has resulted in obvious saline areas (seeps) in the field. The recharge area of the seep must be determined before the extents of the treatment can be planned. Analysis of the soil conditions in areas in and around the affected saline areas (2, five acres seeps) has not been completed. The remaining 90 acres of the field will be assessed to determine groundwater gradients and extents of the recharge area.

After Situation:

A determination of extent of recharge area has been made. The area to be treated has been identified (10 acres). Treatments include: soil testing to determine the salt concentrations, establishing permanent vegetative cover in saline areas (342), modify the crop rotation to increase seasonal water use (328), and reduced tillage practices (either 345 or 329). The producer has developed and is carrying out a Salinity and Sodic Soil Management Plan. The water cycle is balanced to minimize upward movement of salts to the surface, reducing evaporation, resulting in increase productivity across the field Ten acres of dryland wheat will be replaced with grass due to the saline/sodic conditions.

Feature Measure: Acres included in Salinity and Sodic

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $4,321.97

Scenario Cost/Unit: $43.22

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.39	1	$116.39
Foregone Income						
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acres	$272.50	10	$2,725.00
FI, Hay, General Grass	2122	General Grass Hay is Primary Land Use	Ton	$49.18	-10	($491.80)
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	40	$1,944.00
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$14.19	2	$28.38

Practice: 610 - Salinity and Sodic Soil Management

Scenario: #10 - Soil Management (Irrigated) (FI)

Scenario Description:

The producer secures training in Salinity and Sodic Soil Management and develops and carries out a Salinity and Sodic Soil Management Plan. Scenario includes cost of attending a 6 hr University, NRCS, or commodity group sponsored training session and 40 hours of mgt labor a year to analyze available data and field situation, develop (or review and modify as necessary) plan and carry it out. Sampling on a 3-5 year interval is recommended if conditional soils are irrigated or marginal irrigation water is used. Monitor (sample) one site per 40 acres of each major soil. Monitoring prodedures include; GPS reference all sites, duplicate (2 samples) all sites of each major soil, sampled after harvest, to a depth of 6 feet and examined to 10 feet noting water table depth. Also sample each genetic soil horizon or portion no greater than 12 inches. Monitoring should be done by or under the supervision of an experienced soil scientist.Resource Concerns: Soil Quality Degradation - Concentration of salts or other chemicals, and Water Quality Degradation- Excessive salts in surface and ground waters.Associated Practices: 328-Conservation Crop Rotation; Residue Managements (either 345 or 329); 449-Irrigation Water Management; and 590-Nutrient Management.'

Before Situation:

Saline and/or sodic conditions have developed in the root zone of a 100 acre irrigated cropland field resulting in decreased soil quality, plant health and vigor and yield reductions. Irrigation water quality (levels of salts and sodium) is unknown, water is applied in excess of crop need and the majority of soils in the field suitable for irrigation. Crop rotation includes; corn, soybean and spring wheat. Affected area equals 20 acres.

After Situation:

Producer conducts soil conductivity and salinity test to determine the root zone depth of water application necessary for flushing accumulated salts and maintaining a proper salt balance. Producer conducts irrigation suitability test of water supply results to determine suitability of applied water for irrigation and additional irrigation volumes needed for leaching. Routine periodic checks of water EC will be conducted by producer to monitor for water salinity which might require changes to Salinity and Sodic Soil Management Plan. The Salinity and Sodic Soil Management Plan is carried out employing soil and water testing and as applicable changes in Irrigation Water Management (449), Conservation Crop Rotation (328), Residue Management (345 or 329) and use of soil amendments (where applicable). The producer is implementing a Salinity and Sodic Soil Management Plan resulting in improved soil quality and plant health. Twenty acres of irrigated cropland will be replace with grass due to the saline/sodic conditions.

Feature Measure: Acres included in Salinity and Sodic

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $11,396.93

Scenario Cost/Unit: $113.97

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.39	1	$116.39
Foregone Income						
FI, Corn Irrigated	1960	Irrigated Corn is Primary Crop	Acres	$554.19	10	$5,541.90
FI, Soybeans Irrigated	1962	Irrigated Soybeans is Primary Crop	Acres	$403.06	10	$4,030.60
FI, Hay, General Grass	2122	General Grass Hay is Primary Land Use	Ton	$49.18	-40	($1,967.20)
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	40	$1,944.00
Materials						
Test, Standard Water Test, Irrigation Suitability	310	Irrigation water suitability lab analysis. Includes pH, alkalinity, carbonates/bicarbonates, EC, dissolved solids, B, Cl, Ca, Mg, Na, SAR, and hardness.	Each	$56.80	1	$56.80
Testing, soil sampling and EC analysis, bore hole	2055	Collecting and testing 5 soil samples per 60 inch bore hole. Inclueds EC measurements. Includes equipment and labor.	Hours	$418.61	4	$1,674.44

Practice: 612 - Tree/Shrub Establishment

Scenario: #1 - Individual tree, hand planting

Scenario Description:
Tree seedlings will be hand planted in the forested area where few or no forest trees are growing, the existing stand of trees needs underplanting, or the previously planted seedling tree stocking level is below desirable conditions. Wildlife habitat is degraded by loss of forest conditions.

Before Situation:
The stocking level of the forest does not meet the minimum recommended number of trees per acre. The existing condition of the forest stand does not meet the landowners objectives. To be a viable forest additional seedlings need planting. Wildlife habitat is rated poor.

After Situation:
The prescribed number of trees are hand planted on 20 acres, and the objectives of the landowner are met. The forest will provide wildlife habitat, provide a long term ground cover, and capture atmospheric carbon.

Feature Measure: Area Planted

Scenario Unit: Each

Scenario Typical Size: 6,000.00

Scenario Total Cost: $9,957.40

Scenario Cost/Unit: $1.66

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	18	$456.48
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$12.51	48	$600.48
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	84	$2,411.64
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	8	$388.80
Materials						
Tree, Conifer, Seedling, Medium	1514	Containerized conifer seedlings, 8 or 10 cubic inches; or bare root conifer seedlings 1+1 (two-year old seedlings that grew one year in the original seedbed and another year in a transplant bed), or bare root seedlings 2+0 (two-year old seedlings grown in their original seedbed). Includes materials and shipping only.	Each	$1.00	6000	$6,000.00
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	100	$100.00

Practice: 612 - Tree/Shrub Establishment

Scenario: #2 - Medium Density, Conifer, hand plant, with bud caps

Scenario Description:
Tree seedlings will be hand planted in the forested area where few or no forest trees growing, the existing stand of trees needs underplanting, or the previously planted seedling tree stocking level is below desirable conditions. Seedlings are protected from wildlife browsing. Wildlife habitat is degraded by loss of forest conditions.

Before Situation:
The stocking level does not meet the minimum recommended number of trees per acre and does not meet the landowners objectives. To be a viable forest additional seedlings need planting. Wildlife habitat is rated poor. Wildlife are known to browse tree seedlings in the area causing great damage.

After Situation:
The prescribed number of trees are hand planted, and the objectives of the landowner are met. Seedlings are protected from widlife browsing by installing some type of protection devise. A forest will provide wildlife habitat, provide a long term ground and capture atmospheric carbon.

Feature Measure: Each Planted Seedling

Scenario Unit: Each

Scenario Typical Size: 6,000.00

Scenario Total Cost: $10,614.68

Scenario Cost/Unit: $1.77

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	4	$101.44
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$12.51	12	$150.12
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	112	$3,215.52
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	16	$777.60
Materials						
Tree, Conifer, Seedling, Medium	1514	Containerized conifer seedlings, 8 or 10 cubic inches; or bare root conifer seedlings 1+1 (two-year old seedlings that grew one year in the original seedbed and another year in a transplant bed), or bare root seedlings 2+0 (two-year old seedlings grown in their original seedbed). Includes materials and shipping only.	Each	$1.00	6000	$6,000.00
Bud caps	1574	Poly-mesh or paper material that protect terminal bud from browsing. Materials only.	Each	$0.09	3000	$270.00
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	100	$100.00

Practice: 612 - Tree/Shrub Establishment

Scenario: #3 - Individual Tree with Mesh Protectors

Scenario Description:

This scenario involves hand planting of tree seedlings due to low stocking levels or undesirable tree species after the site has been prepared for seedling growth and establishment. A Forester will evaluate planting project and provide guidance to support selection of plant materials, planting operations and other measures. Newly planted conifer seedlings are protected from environmental stressors by installing open tree tubes. Terrain is moderate. Resource concerns include: Plant Structure and Composition; Plant Productivity and Health; Plant Pest Pressure; Animal Terrestrial Habitat for Wildlife and Invertebrates; Soil Organic Matter Depletion; Soil Sheet and Rill Erosion

Before Situation:

The land has a little/no tree cover, or is stocked with the undesirable tree species. Competing vegetation is a before and after planting concern. Soil condition is degraded due to the loss of the native forest ecosystem (organic matter in top soil depleted).

After Situation:

Typical setting is 40 acres planted at 450 trees per acre. Vexar mesh tubes, or similar measures protect seedlings??from environmental stressors. Soil conditions will improve as??seedlings grow and??develop.??Forest vegetation creates corridors for wildlife movement.

Feature Measure: Area of Treatment

Scenario Unit: Each

Scenario Typical Size: 18,000.00

Scenario Total Cost: $71,262.10

Scenario Cost/Unit: $3.96

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	10	$253.60
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$12.51	380	$4,753.80
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	390	$11,196.90
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	20	$972.00
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	4	$445.80
Materials						
Tree, Conifer, Seedling, Medium	1514	Containerized conifer seedlings, 8 or 10 cubic inches; or bare root conifer seedlings 1+1 (two-year old seedlings that grew one year in the original seedbed and another year in a transplant bed), or bare root seedlings 2+0 (two-year old seedlings grown in their original seedbed). Includes materials and shipping only.	Each	$1.00	18000	$18,000.00
Tree shelter, mesh tree tube, 48 in.	1556	48 inch tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only.	Each	$1.54	18000	$27,720.00
Stakes, bamboo 3/8 in. x 48 in.	1585	3/8 in. x 48 in. bamboo stakes to anchor items in place. Inlcudes materials and shipping only.	Each	$0.44	18000	$7,920.00

Practice: 612 - Tree/Shrub Establishment

Scenario: #8 - Hardwood mechanical planting, bare root, with tree protectors

Scenario Description:
Improving the hardwood forest setting by mechanical planting hardwood tree seedlings. Seedlings are protected from environmental stressors. The number of trees to plant is lower than establishing a new forest.

Before Situation:
In an existing upland forest the present trees are poor quality, at low stocking levels, or are undesirable species. Existing conditions do not meet landowner objectives of growing high quality trees. Wildlife habitat is poor due to the above described conditions. Prior to planting any needed vegetation control will be conducted first.

After Situation:
The area of treatment is 10 acres. Bare root hardwood seedlings are planted mechanically in the best locations for seedling survival. Solid tree tubes are installed to protect seedlings from environmental stressors. Post planting vegetation control is planned to ensure seedling survival.

Feature Measure: Area of Treatment

Scenario Unit: Each

Scenario Typical Size: 850.00

Scenario Total Cost: $7,062.00

Scenario Cost/Unit: $8.31

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	8	$202.88
Mechanical tree planter	1600	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hours	$5.96	6	$35.76
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	30	$861.30
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	8	$388.80
Materials						
Tree, Hardwood, Seedling, Small	1509	Bare root hardwood seedlings 6 to 18 inches tall; includes tropical containerized seedlings of 8 cubic inches or smaller. Includes materials and shipping only.	Each	$0.95	850	$807.50
Tree shelter, solid tube type, 4 in. x 48 in.	1566	4 inch x 48 inch tree tube for protection from animal damage. Materials and shipping only.	Each	$5.29	425	$2,248.25
Stakes, wood, 3/4 in. x 3/4 in. x 48 in.	1582	3/4 in. x 3/4 in. x 48 in. wood stakes to fasten items in place. Includes materials only.	Each	$2.09	425	$888.25
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	100	$100.00
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 612 - Tree/Shrub Establishment

Scenario: #9 - Individual Tree, 1-gallon pots

Scenario Description:
Tree seedlings (potted) to be planted for rapid afforestation due to environmental stressors. Planting will be by hand. The resource setting is an area that historically was an upland hardwood forest. Resource concerns include: Plant Structure and Composition; Plant Productivity and Health; Animal Terrestrial Habitat for Wildlife and Invertebrates.

Before Situation:
The native forest that has been removed and the land is either row cropped, grazed or hayed, brushy forest or degraded. If any upland trees exist they are poor quality tree or undesirable species and not adequately regenerating.

After Situation:
The area of treatment is 10 acres where 300 trees per acre are hand planted. Potted/containerized hardwood seedlings are established for rapid afforestation. Post vegetation control should be evaluated and conducted it necessary. This will result in a fully stocked forest with healthy trees to support the resource concern.

Feature Measure: Area of Treatment

Scenario Unit: Each

Scenario Typical Size: 3,000.00

Scenario Total Cost: $20,070.48

Scenario Cost/Unit: $6.69

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	6	$152.16
Trailer, enclosed, small	1503	Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included.	Hours	$14.56	6	$87.36
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$12.51	96	$1,200.96
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	100	$2,871.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	12	$583.20
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	4	$445.80
Materials						
Tree, Hardwood, Potted, Small	1529	Potted hardwood seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$4.91	3000	$14,730.00

Practice: 612 - Tree/Shrub Establishment

Scenario: #55 - Individual Tree with Woven Wire Tree Cage

Scenario Description:

Tree seedlings will be hand planted in the forested area where few or no forest trees are growing, the existing stand of trees needs underplanting, or the previously planted seedling tree stocking level is below desirable conditions. The tree planting site has significant environmental stressors that would greatly impact survival of the seedlings. Resource concerns include: Plant Structure and Composition; Plant Productivity and Health; Animal Terrestrial Habitat for Wildlife and Invertebrates.

Before Situation:

The stocking level of the forest does not meet the minimum recommended number of trees per acre. The existing condition of the forest stand does not meet the landowner???s objectives. To be a viable forest additional seedlings need planting. Wildlife habitat is rated poor.

After Situation:

300 trees per acre are hand planted on 20 acres, and the objectives of the landowner are met. Various types and combinations of plant materials may be used, including bare root and/or containerized trees/shrubs, and conifer and/or deciduous species or mixtures. Wire cages will be constructed and placed around each tree; each cage will be supported by two t-post. The forest will provide wildlife habitat, provide a long term ground cover, and capture atmospheric carbon.

Feature Measure: Area Planted

Scenario Unit: Each

Scenario Typical Size: 6,000.00

Scenario Total Cost: $196,019.08

Scenario Cost/Unit: $32.67

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	10	$253.60
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$12.51	960	$12,009.60
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	1000	$28,710.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	20	$972.00
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	4	$445.80
Materials						
Wire, Woven, Galvanized, 12.5 Gauge, 48 inch	4	Galvanized 12.5 gauge, 48 in. - 330' roll. Includes materials and shipping only.	Each	$334.44	182	$60,868.08
Post, Steel T, 1.33 lbs, 6 ft.	15	Steel Post, Studded 6 ft. - 1.33 lb. Includes materials and shipping only.	Each	$7.23	12000	$86,760.00
Tree, Conifer, Seedling, Medium	1514	Containerized conifer seedlings, 8 or 10 cubic inches; or bare root conifer seedlings 1+1 (two-year old seedlings that grew one year in the original seedbed and another year in a transplant bed), or bare root seedlings 2+0 (two-year old seedlings grown in their original seedbed). Includes materials and shipping only.	Each	$1.00	6000	$6,000.00

Practice: 612 - Tree/Shrub Establishment

Scenario: #67 - Tree/Shrub Regeneration Area with Protection

Scenario Description:

Naturally regenerate a forest stand using properly timed even-aged overstory harvesting methods and necessary site preparation. When implemented with the guidance of a professional forester, such silvicultural activities result in well stocked stands representative of the natural community. Standard forestry measures are used to provide temporary protection for regenerating trees, to improve the likelihood of successful regeneration and achieve landowner objectives for future forest stand composition. Seedlings are protected by temporary 8' high fencing materials or poly netting, designed to be moved when regeneration is established. Clearing of brush and undesirable trees is not necessary. Resource concerns include: Degraded Plant Condition - Inadequate structure and composition, Undesirable plant productivity and health, and/or Inadequate wildlife & fish habitat; and/or Water Quality Degradation - Excessive sediment in surface waters.

Before Situation:

Forest stands lack the desired species composition and/or structure, and/or have been impacted by environmental stressors and are unhealthy. Wildlife habitat is inadequate. Forest conditions do not meet landowner objectives. Environmental conditions are limiting to natural forest regeneration and establishment, and temporary protection will be needed. Primary resource concerns are Degraded Plant Condition - Inadequate structure and composition and Inadequate wildlife & fish habitat.

After Situation:

Natural forest regeneration has been accomplished on 20 acres of forest land. Trees are successfully established and the forest exhibits the planned mix of diverse native tree species. The future forest will improve degraded plant condition, reduce soil erosion, establish wildlife habitat, and sequester carbon.

Feature Measure: Area of Treatment

Scenario Unit: Acres

Scenario Typical Size: 20.00

Scenario Total Cost: $11,754.03

Scenario Cost/Unit: $587.70

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	8	$202.88
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Materials						
Wire, Woven, Wildlife, 96 in.	6	High Tensile 12.5 gauge, 96 inch - 330 foot roll. Includes materials and shipping only.	Each	$711.97	12	$8,543.64
Post, Wood, CCA treated, 6 in. x 12-14 ft.	13	Wood Post, Line/End 6 inch dia. X 12-14 ft., CCA Treated. Includes materials and shipping only.	Each	$38.98	30	$1,169.40
Post, Steel T, 1.33 lbs, 10 ft.	17	Steel Post, Studded 10 ft. - 1.33 lb. Includes materials and shipping only.	Each	$12.88	30	$386.40
Fence, Wire Assembly, Woven Wire	35	Brace pins, twist sticks, staples. Includes materials and shipping only.	Feet	$0.15	3750	$562.50
Property/Safety Signs	293	Plastic fence safety or property sign, printed on both sides with 6 pre-drilled holes for hanging or nailing. 7.5 x 4.75 inch. Includes materials and shipping only.	Each	$2.09	38	$79.42
Gate, Game, 8 ft. High X 4 ft. Wide	1082	4 Foot wide game gate (8 feet tall). Includes materials and shipping only.	Each	$276.17	1	$276.17
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 612 - Tree/Shrub Establishment

Scenario: #73 - Perimeter Based Tree-Shrub Regeneration Area with Protection

Scenario Description:

Naturally regenerate a forest stand using properly timed even-aged overstory harvesting methods and necessary site preparation. When implemented with the guidance of a professional forester, such silvicultural activities result in well stocked stands representative of the natural community. Standard forestry measures are used to provide temporary protection for regenerating trees, to improve the likelihood of successful regeneration and achieve landowner objectives for future forest stand composition. Seedlings are protected by temporary 8' high fencing materials or poly netting, designed to be moved when regeneration is established. Clearing of brush and undesirable trees is not necessary. Resource concerns include: Plant Structure and Composition; Plant Productivity and Health; Animal Terrestrial Habitat for Wildlife and Invertebrates.

Before Situation:

Forest stands lack the desired species composition and/or structure, and/or have been impacted by environmental stressors and are unhealthy. Wildlife habitat is inadequate. Forest conditions do not meet landowner objectives. Environmental conditions are limiting to natural forest regeneration and establishment, and temporary protection will be needed.

After Situation:

Natural forest regeneration has been accomplished on 5 acres of forest land. Trees are successfully established and the forest exhibits the planned mix of diverse native tree species. The future forest will improve degraded plant condition, reduce soil erosion, establish wildlife habitat, and sequester carbon. Perimeter of the five acre area was calculated as a 330' X 660' rectangle.

Feature Measure: Perimeter of area

Scenario Unit: Linear Feet

Scenario Typical Size: 1,980.00

Scenario Total Cost: $8,786.10

Scenario Cost/Unit: $4.44

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	2	$50.72
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	40	$1,148.40
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	4	$445.80
Materials						
Wire, Woven, Wildlife, 96 in.	6	High Tensile 12.5 gauge, 96 inch - 330 foot roll. Includes materials and shipping only.	Each	$711.97	6	$4,271.82
Post, Wood, CCA treated, 6 in. x 12-14 ft.	13	Wood Post, Line/End 6 inch dia. X 12-14 ft., CCA Treated. Includes materials and shipping only.	Each	$38.98	40	$1,559.20
Post, Steel T, 1.33 lbs, 10 ft.	17	Steel Post, Studded 10 ft. - 1.33 lb. Includes materials and shipping only.	Each	$12.88	40	$515.20
Fence, Wire Assembly, Woven Wire	35	Brace pins, twist sticks, staples. Includes materials and shipping only.	Feet	$0.15	1980	$297.00
Property/Safety Signs	293	Plastic fence safety or property sign, printed on both sides with 6 pre-drilled holes for hanging or nailing. 7.5 x 4.75 inch. Includes materials and shipping only.	Each	$2.09	19	$39.71
Gate, Game, 8 ft. High X 4 ft. Wide	1082	4 Foot wide game gate (8 feet tall). Includes materials and shipping only.	Each	$276.17	1	$276.17
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08

Practice: 612 - Tree/Shrub Establishment

Scenario: #82 - Individual Tree with Solid Protector

Scenario Description:
This scenario involves understory planting in a monoculture that is at risk of disease or pest issues. Terrain is flat and areas are unsuitable to mechanical tree planting due to inundation, rock outcrops, and tip-ups so the area is hand planted. Resource concerns include: Plant Structure and Composition; Plant Pest Pressure; Plant Productivity and Health; Animal Terrestrial Habitat for Wildlife and Invertebrates

Before Situation:
The overstory is dominated by a single species of trees with risk of disease or pest issues to wipe out the entire stand. The landowner???s desired future condition is for the area to remain forested with a diverse and resilient mix of species. To retain the area in a forested condition long term, the area needs to have understory stocked with many tree and shrub species.

After Situation:
440 trees will be planted in an acre of a difficult planting site. Transition to a diverse forest will be established with understory planting used to combat habitat requirements, plant pests or other issues related to monotypic forest composition.

Feature Measure: Each Planted Tree

Scenario Unit: Each

Scenario Typical Size: 440.00

Scenario Total Cost: $5,944.42

Scenario Cost/Unit: $13.51

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	2	$50.72
Trailer, enclosed, small	1503	Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included.	Hours	$14.56	2	$29.12
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$12.51	28	$350.28
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	30	$861.30
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	4	$194.40
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	4	$445.80
Materials						
Tree, Hardwood, Seedling, Medium	1510	Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only.	Each	$1.74	440	$765.60
Tree shelter, solid tube type, 5 in. x 48 in.	1571	5 inch x 48 inch tree tube for protection from animal damage. Materials and shipping only.	Each	$5.29	440	$2,327.60
Stakes, wood, 3/4 in. x 3/4 in. x 48 in.	1582	3/4 in. x 3/4 in. x 48 in. wood stakes to fasten items in place. Includes materials only.	Each	$2.09	440	$919.60

Practice: 612 - Tree/Shrub Establishment

Scenario: #89 - Hardwood Est.-Direct Seeding

Scenario Description:
Native seed (acorns, nuts, etc.) from native tree species are broadcast-seeded and lightly tilled into the soil. Native seeds are purchased locally to produce trees known to be adapted to local conditions. Site preparation is completed prior to seeding using CPS 490-Tree/Shrub Site Preparation.Resource concerns are: Plant Structure and Composition; Plant Productivity and Health; Terrestrial Habitat for Wildlife and Invertebrates.

Before Situation:
In forested settings, the forest is degrading. Valuable trees are not present, or are not regenerating due to changes in the natural disturbance regime or past harvesting. Undesirable shade-tolerant tree species have regenerated and either dominate the site or compete with desirable species. In openland settings, current vegetative cover is undesirable and does not address resource concerns.

After Situation:
Seed from native tree species has been planted at prescribed rates. Plant condition and terrestrial wildlife habitat are improving.

Feature Measure: Area of Treatment

Scenario Unit: Acres

Scenario Typical Size: 10.00

Scenario Total Cost: $6,862.66

Scenario Cost/Unit: $686.27

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	4	$59.52
Seeding Operation, Broadcast, Ground	959	Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs.	Acres	$14.02	10	$140.20
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$36.34	4	$145.36
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	6	$172.26
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	4	$121.44
Materials						
Trees and shrubs, seed	1871	Tree or shrub seed, e.g., acorns, to establish trees. Includes materials and shipping only.	Pound	$9.36	600	$5,616.00
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	2	$607.88

Practice: 612 - Tree/Shrub Establishment

Scenario: #112 - Tree-Shrub Establishment - Small Acreage

Scenario Description:
Seedling (potted) to be planted for conservation purposes other than reforestation. Planting will be by hand. The resource setting is an area that historically was an upland forest. Resource concerns are degraded plant condition - undesirable productivity and health, and inadequate structure and composition; inadequate habitat for fish and wildlife.

Before Situation:
The native forest has been removed and the land is either row cropped, farmstead, or associated agricultural land. If any upland trees exist, they are poor quality or undesirable species. Terrain is gently to moderately sloping with soil erosion-sheet and rill occurring.

After Situation:
Typical treatment area can range from less than 1 acre to 5 acres; typical scenario based on 1 ac, 150 TPA. Potted/containerized hardwood seedlings are planted by hand. Post vegetation control should be evaluated and conducted, if necessary.

Feature Measure: Planted Seedling

Scenario Unit: Each

Scenario Typical Size: 150.00

Scenario Total Cost: $2,901.65

Scenario Cost/Unit: $19.34

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	2	$50.72
Trailer, flatbed, small	1505	Small flatbed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included.	Hours	$10.36	3	$31.08
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$12.51	5	$62.55
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	35	$1,004.85
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	2	$97.20
Materials						
Shrub, Potted, Small	1524	Potted shrub seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$7.79	75	$584.25
Tree, Hardwood, Potted, Medium	1532	Potted hardwood seedling, 2 gallons or larger. Includes materials and shipping only.	Each	$14.28	75	$1,071.00

Practice: 612 - Tree/Shrub Establishment

Scenario: #117 - Existing Regeneration with Protection

Scenario Description:

Wire cages are set in place around naturally regenerated tree or shrub seedlings to protect them from environmental stressors, allowing them to mature to saplings and then on to mature plants. Cages provide temporary protection and are large enough to allow room for growth over 5-10 years. They are typically 4 ft. tall x 2 ft. diameter construction with 2x4 in. wire mesh fencing staked in place with 2 decay-resistant hardwood stakes. The resource setting typically is an oak woodland, riparian restoration, or wildlife areas where 100 seedings are naturally occurring but need protection to ensure growth to maturity. Resource concerns addressed include: Plant productivity and health, Plant structure and composition, Terrestrial habitat for wildlife and invertebrates, and Sediment transported to surface water.

Before Situation:

Oak woodland and/or riparian area that is in a degrading state with little to no saplings due to various environmental stressors.

After Situation:

Existing, naturally occurring tree or shrub seedling are staked and protected, typically using wire cages. Trees/shrubs may be scattered or more densely grouped, but typical area treated is about 5 acres. Allows for locally adapted native species to establish that are more resilient to disease and other environmental pressures.

Feature Measure: Per Seedling Protected

Scenario Unit: Each

Scenario Typical Size: 100.00

Scenario Total Cost: $1,323.54

Scenario Cost/Unit: $13.24

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	2	$50.72
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	14	$401.94
Materials						
Wire, Woven, Galvanized, 12.5 Gauge, 48 inch	4	Galvanized 12.5 gauge, 48 in. - 330' roll. Includes materials and shipping only.	Each	$334.44	2	$668.88
Stakes, wood, 1 in. x 1 in. x 36 in.	1577	1 in. x 1 in. x 36 in. wood stakes to fasten items in place. Includes materials only.	Each	$1.01	200	$202.00

Practice: 612 - Tree/Shrub Establishment

Scenario: #118 - Tree/Shrub Planted Area with Protection

Scenario Description:

Tree/shrub seedlings will be hand planted in a 5-acre (467' x 467') open or forested area where few or no forest trees are currently growing, resulting in a well-stocked stand of a predetermined species composition. Standard forestry measures are used to provide temporary protection for planted trees, to improve the likelihood of successful establishment and to achieve landowner objectives for future forest stand composition. Seedlings are protected by temporary 8' high fencing materials designed to be removed when regeneration is established. Resource concerns addressed include: Plant productivity and health, Plant structure and composition, Terrestrial habitat for wildlife and invertebrates, and Sediment transported to surface water.

Before Situation:

The planting area lacks the desired species composition and structure and is impacted by environmental stressors. Wildlife habitat is inadequate. Forest conditions do not meet landowner objectives. Environmental conditions are limiting to natural forest regeneration and establishment, and tree/shrub planting along with temporary protection will be needed. Primary resource concerns are Plant structure and composition and Terrestrial habitat for wildlife and invertebrates.

After Situation:

Trees/shrubs have been successfully established on 5 acres of forest land. The re-established forest exhibits the planned mix of diverse native tree species. The future forest will improve identified resource concerns to a sustainable level.

Feature Measure: Area

Scenario Unit: Acres

Scenario Typical Size: 5.00

Scenario Total Cost: $9,983.88

Scenario Cost/Unit: $1,996.78

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	20	$507.20
Trailer, enclosed, small	1503	Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included.	Hours	$14.56	20	$291.20
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	28	$803.88
Materials						
Wire, Woven, Wildlife, 96 in.	6	High Tensile 12.5 gauge, 96 inch - 330 foot roll. Includes materials and shipping only.	Each	$711.97	6	$4,271.82
Post, Wood, CCA treated, 6 in. x 12-14 ft.	13	Wood Post, Line/End 6 inch dia. X 12-14 ft., CCA Treated. Includes materials and shipping only.	Each	$38.98	6	$233.88
Post, Steel T, 1.33 lbs, 10 ft.	17	Steel Post, Studded 10 ft. - 1.33 lb. Includes materials and shipping only.	Each	$12.88	94	$1,210.72
Fence, Wire Assembly, Woven Wire	35	Brace pins, twist sticks, staples. Includes materials and shipping only.	Feet	$0.15	1868	$280.20
Property/Safety Signs	293	Plastic fence safety or property sign, printed on both sides with 6 pre-drilled holes for hanging or nailing. 7.5 x 4.75 inch. Includes materials and shipping only.	Each	$2.09	19	$39.71
Gate, Game, 8 ft. High X 4 ft. Wide	1082	4 Foot wide game gate (8 feet tall). Includes materials and shipping only.	Each	$276.17	1	$276.17
Tree, Hardwood, Seedling, Small	1509	Bare root hardwood seedlings 6 to 18 inches tall; includes tropical containerized seedlings of 8 cubic inches or smaller. Includes materials and shipping only.	Each	$0.95	2178	$2,069.10

Practice: 614 - Watering Facility

Scenario: #3 - Frost Free Fountain

Scenario Description:

A small permanent watering facility for a typical grazing system pasture where livestock need to access water. Typically a prefabricated two-hole, frost-free, on-demand drinker. All watering facilities will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. This watering facility will address the resource concerns of inadequate supply of water for livestock and or wildlife, habitat degradation, water quality, and undesirable plant productivity and health.

Before Situation:

This practice applies to all land uses where there is a need for new or improved watering facilities for livestock where water is not available in sufficient quantities at specific locations, water quality, plant productivity and health needs to be improved.

After Situation:

A small permanent watering facility for a typical grazing system pasture where livestock need to access water. Typically a prefabricated two-hole, frost-free, on-demand drinker is installed which includes all tank materials, tank plumbing and float valve, to provide adequate water storage capacity to ensure an adequate supply and quality of water for livestock and provides improved plant productivity and health, and water quality. All watering facilities are constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation and placed on a properly prepared foundation with required plumbing. All needed pipelines are installed using Livestock Pipeline (516). Any needed vegetation of disturbed areas will use Critical Area Planting (342). All collectors or catchments for collecting precipitation will be addressed by using Water Harvesting Catchment (636). Any needed water source installation will use Water Well (642), Pumping Plant (533), Spring Development (574), or Livestock Pipeline (516) as appropriate. Areas around watering facilities where animal concentrations or overflow from the watering facility will cause resource concerns will be protected by using Heavy Use Area Protection (561) as appropriate.

Feature Measure: per tank

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $937.22

Scenario Cost/Unit: $937.22

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formless, non reinforced	36	Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$220.05	0.1	$22.01
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	1	$25.36
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	3	$86.13
Materials						
Tank, Freeze Proof, 2 hole	280	Tank, Freeze Proof with 2 drinking holes. Includes materials and shipping.	Each	$803.72	1	$803.72

Practice: 614 - Watering Facility

Scenario: #5 - Tank less than or equal to 150 gallons

Scenario Description:

A permanent watering facility for livestock and or wildlife constructed of approved materials with 150 gallons or less capacity that stores adequate quantity and quality of water for storage and or direct drinking access. Typical tank size is 100 gallons. All watering facilities will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. This watering facility will address the resource concerns of inadequate supply of water for livestock, habitat degradation, water quality, and undesirable plant productivity and health. A separately contacted Heavy Use Area Protection 561 may be needed depending on site conditions.

Before Situation:

This practice applies to all land uses where there is a need for new or improved watering facilities for livestock and or wildlife, where water is not available in sufficient quantities at specific locations, and habitat, water quality, plant productivity and health needs to be improved.

After Situation:

A permanent watering facility with a capacity of 150 gallons or less is installed with all tank materials, tank plumbing and float valve, to provide adequate water storage capacity to ensure an adequate supply and quality of water for livestock or wildlife for storage and or direct drinking access and provides improved plant productivity and health, water quality, and habitat. Typical size is a 100 gallon tank. All watering facilities are constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation and placed on a properly prepared foundation with required plumbing. All needed pipelines are installed using Livestock Pipeline (516). Any needed vegetation of disturbed areas will use Critical Area Planting (342). All collectors or catchments for collecting precipitation will be addressed by using Water Harvesting Catchment (636). Any needed water source installation will use Water Well (642), Pumping Plant (533), Spring Development (574), or Livestock Pipeline (516) as appropriate. Areas around watering facilities where animal concentrations or overflow from the watering facility will cause resource concerns will be protected by using Heavy Use Area Protection (561) as appropriate. A separately contacted Heavy Use Area Protection 561 may be needed depending on site conditions.

Feature Measure: Capacity in Gallons

Scenario Unit: Gallons

Scenario Typical Size: 100.00

Scenario Total Cost: $333.98

Scenario Cost/Unit: $3.34

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	1	$25.36
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	2	$57.42
Materials						
Wildlife Escape Ramp	242	Pool size 15' x 30', for small mammals less than one pound.	Each	$76.20	1	$76.20
Tank, Poly Livestock, >75 - 300 gallon	1064	Includes tank materials and float valve	Gallons	$1.75	100	$175.00

Practice: 614 - Watering Facility

Scenario: #6 - Tank Greater Than 150 and Less Than or Equal to 500 Gallons

Scenario Description:

A permanent watering facility for livestock and or wildlife constructed of approved materials with greater than 150 to 500 gallons of capacity that stores adequate quantity and quality of water for storage and or direct drinking access. Typical tank size is 200 gallons. All watering facilities will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. This watering facility will address the resource concerns of inadequate supply of water for livestock, habitat degradation, water quality, and undesirable plant productivity and health. A separately contacted Heavy Use Area Protection 561 may be needed depending on site conditions.

Before Situation:

This practice applies to all land uses where there is a need for new or improved watering facilities for livestock and or wildlife, where water is not available in sufficient quantities at specific locations, and habitat, water quality, plant productivity and health needs to be improved.

After Situation:

A watering facility with a capacity of greater than 150 to 500 gallons is installed with all tank materials, tank plumbing and float valve, to provide adequate water storage capacity to ensure an adequate supply and quality of water for livestock or wildlife for storage and or direct drinking access and provides improved plant productivity and health, water quality, and habitat. Typical size is a 200 gallon galvanized steel tank. All watering facilities are constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation and placed on a properly prepared foundation with required plumbing. All needed pipelines are installed using Livestock Pipeline (516). Any needed vegetation of disturbed areas will use Critical Area Planting (342). All collectors or catchments for collecting precipitation will be addressed by using Water Harvesting Catchment (636). Any needed water source installation will use Water Well (642), Pumping Plant (533), Spring Development (574), or Livestock Pipeline (516) as appropriate. Areas around watering facilities where animal concentrations or overflow from the watering facility will cause resource concerns will be protected by using Heavy Use Area Protection (561) as appropriate. A separately contacted Heavy Use Area Protection 561 may be needed depending on site conditions.

Feature Measure: Capacity in Gallons

Scenario Unit: Gallons

Scenario Typical Size: 200.00

Scenario Total Cost: $498.34

Scenario Cost/Unit: $2.49

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	2	$50.72
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	2	$57.42
Materials						
Wildlife Escape Ramp	242	Pool size 15' x 30', for small mammals less than one pound.	Each	$76.20	1	$76.20
Tank, Galvanized Steel Livestock, >75 - 300 gallon	1067	Includes tank materials and float valve	Gallons	$1.57	200	$314.00

Practice: 614 - Watering Facility

Scenario: #7 - Tank Greater Than 500 Gallons

Scenario Description:

A tank constructed of approved materials with a capacity to store an adequate quantity and quality of water for storage and or direct drinking access. All watering facilities will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. Water storage may be provided using poly tanks, rubber tire tanks or other approved materials. This watering facility will address the resource concerns of inadequate supply of water for livestock, habitat degradation, water quality, and undesirable plant productivity and health.

Before Situation:

This practice applies to all land uses where there is a need for new or improved watering facilities for livestock and or wildlife, where water is not available in sufficient quantities at specific locations, and habitat, water quality, plant productivity and health needs to be improved.

After Situation:

A tank for storing water for livestock is installed with all tank materials, tank plumbing and float valve, to provide adequate water storage capacity to ensure an adequate supply and quality of water for livestock and or direct drinking access and provides improved plant productivity and health, and water quality. A typical installation includes a 1000 gallon poly tank, but other materials may also be used. All watering facilities are constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation and placed on a properly prepared foundation with required plumbing. All needed pipelines are installed using Livestock Pipeline (516). Any needed vegetation of disturbed areas will use Critical Area Planting (342). All collectors or catchments for collecting precipitation will be addressed by using Water Harvesting Catchment (636). Any needed water source installation will use Water Well (642), Pumping Plant (533), Spring Development (574), or Livestock Pipeline (516) as appropriate. Areas around watering facilities where animal concentrations or overflow from the watering facility will cause resource concerns must be protected by using Heavy Use Area Protection (561) as appropriate.

Feature Measure: Capacity in Gallons

Scenario Unit: Gallons

Scenario Typical Size: 1,000.00

Scenario Total Cost: $1,467.13

Scenario Cost/Unit: $1.47

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	2	$50.72
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	2	$57.42
Materials						
Wildlife Escape Ramp	242	Pool size 15' x 30', for small mammals less than one pound.	Each	$76.20	1	$76.20
Tank, Poly Enclosed Storage, >1,000	1075	Water storage tanks. Includes materials and shipping only.	Gallons	$1.18	1000	$1,180.00
Tank, Float Valve Assembly	1077	Float Valve, Stem, Swivel, Float Ball	Each	$102.79	1	$102.79

Practice: 614 - Watering Facility

Scenario: #30 - Geothermal or heated livestock watering facility

Scenario Description:

A small permanent on demand livestock watering facility where livestock need access to water. Typically a prefabricated two-hole, geothermal or heated, on-demand drinker. The watering facility will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. A concrete pad is typically installed under the footprint of the waterer in accordance to manufacturer's recommendations. This watering facility will address the resource concerns of inadequate supply of water for livestock and or wildlife, habitat degradation, water quality, and undesirable plant productivity and health.

Before Situation:

This practice applies to all land uses where there is a need for new or improved watering facilities for livestock where water is not available insufficient quantities at specific locations, water quality, plant productivity and health needs to be improved.

After Situation:

A watering facility where livestock need to access water. Typically a prefabricated two-hole, geothermal or heated , on-demand drinker is installed which includes all tank materials, tank plumbing and float valve, to provide adequate water storage capacity to ensure an adequate supply and quality of water for livestock and provides improved plant productivity and health, and water quality. A concrete pad is provided which extends 18' outside of the footprint of the waterer. Areas around watering facilities where animal concentrations or overflow from the watering facility will cause resource concerns will be protected by using Heavy Use Area Protection (561) as appropriate.

Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $1,489.95

Scenario Cost/Unit: $1,489.95

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formless, non reinforced	36	Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$220.05	1	$220.05
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	3	$86.13
Materials						
Tank, Geothermal Tube Waterer	1062	Two head 18 gallon waterer. Includes materials and shipping only.	Each	$1,183.77	1	$1,183.77

Practice: 614 - Watering Facility

Scenario: #31 - Summer Automatic Waterier

Scenario Description:

A summer automatic waterier where livestock need access to water. This waterier holds smaller amounts of water, keeping fresher water available for the livestock to drink; typically an on-demand type of system. The waterer will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned lifespan of the installation. This waterier will address the resource concerns of inadequate quantity and or quality of water for livestock, and or wildlife, habitat degradation and undesirable plant productivity and health.

Before Situation:

This practice applies to all land uses where there is a need for new or improved summer watering facilities for livestock where water is not available in sufficient quantity or quality, improved water distribution is needed, and plant productivity and health needs to be improved.

After Situation:

A summer waterier where livestock need to access water. Typically, a prefabricated one or two-hole, summer automatic waterier is installed which includes all tank materials, tank plumbing and float valve, to provide adequate water storage capacity to ensure adequate quantity, quality and distribution of water for livestock and provides improved plant productivity and health. Livestock concentration areas around permanently located watering facilities will be protected by using Heavy Use Area Protection (561) as appropriate. Other associated practices may include; Livestock Pipeline (516), Critical Area Planting (342), Water Well (642), Pumping Plant (533), Spring Development (574) as appropriate.

Feature Measure: per tank

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $483.22

Scenario Cost/Unit: $483.22

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	2	$57.42
Materials						
Nose Pump	1052	Materials and delivery.	Each	$425.80	1	$425.80

Practice: 614 - Watering Facility

Scenario: #132 - Permanent Drinking or Storage, Capacity less than 500 Gallons

Scenario Description:

A permanent watering facility as a means for providing controlled access to drinking water for livestock or wildlife constructed of approved materials with less than 500 gallons of capacity that stores adequate quantity and quality of water for storage or direct drinking access. The watering facility will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. The watering facility will address the resource concerns of inadequate supply of water for livestock or wildlife, habitat degradation, water quality, and undesirable plant productivity and health.

Before Situation:

This practice applies to all land uses where there is a need for a watering facility for livestock or wildlife, where there is a source of water that is adequate in quantity and quality for the purpose, and where soils and topography are suitable for a facility to provide controlled access to drinking water for livestock or wildlife to provide daily water requirements, improve animal distribution to better utilize grazing resources, provide a water source that is an alternative to a sensitive resource.

After Situation:

A permanent watering facility as a means for providing controlled access to drinking water for livestock or wildlife constructed of approved materials with less than 500 gallons of capacity, installed with all tank materials, tank plumbing and float valve, that stores adequate quantity and quality of water for storage or direct drinking access. The watering facility will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. The watering facility will address the resource concerns of inadequate supply of water for livestock or wildlife, habitat degradation, water quality, and undesirable plant productivity and health. The watering facility is placed on a properly prepared foundation with all required materials, plumbing and vegetation for stabilizing disturbed areas. All needed pipelines are installed using Livestock Pipeline (516). All collectors or catchments for collecting precipitation will be addressed by using Water Harvesting Catchment (636). Any needed water source installation will use Water Well (642), Pumping Plant (533), Spring Development (574), or Livestock Pipeline (516) as appropriate. Areas around watering facilities where animal concentrations or overflow from the watering facility will cause resource concerns will be protected by using Heavy Use Area Protection (561) as appropriate. All fencing will use Fence (382).

Feature Measure: Capacity in Gallons

Scenario Unit: Gallons

Scenario Typical Size: 250.00

Scenario Total Cost: $1,577.53

Scenario Cost/Unit: $6.31

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	0.5	$1.26
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	2	$132.36
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	2	$50.72
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	3	$86.13
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	2	$60.72
Materials						
Wildlife Escape Ramp	242	Pool size 15' x 30', for small mammals less than one pound.	Each	$76.20	1	$76.20
Tank, Galvanized Steel Livestock, >75 - 300 gallon	1067	Includes tank materials and float valve	Gallons	$1.57	250	$392.50
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$23.32	0.5	$11.66
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$134.97	0.01	$1.35
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 614 - Watering Facility

Scenario: #133 - Permanent Drinking or Storage Capacity from 500 to 1000 Gallons

Scenario Description:

A permanent watering facility as a means for providing controlled access to drinking water for livestock or wildlife constructed of approved materials with 500 to 1,000 gallons of capacity that stores adequate quantity and quality of water for storage or direct drinking access. The watering facility will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. The watering facility will address the resource concerns of inadequate supply of water for livestock or wildlife, habitat degradation, water quality, and undesirable plant productivity and health.

Before Situation:

This practice applies to all land uses where there is a need for a watering facility for livestock or wildlife, where there is a source of water that is adequate in quantity and quality for the purpose, and where soils and topography are suitable for a facility to provide controlled access to drinking water for livestock or wildlife to provide daily water requirements, improve animal distribution to better utilize grazing resources, provide a water source that is an alternative to a sensitive resource.

After Situation:

A permanent watering facility as a means for providing controlled access to drinking water for livestock or wildlife constructed of approved materials with a capacity of 500 to 1,000 gallons of capacity, installed with all tank materials, tank plumbing and float valve, that stores adequate quantity and quality of water for storage or direct drinking access. The watering facility will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. The watering facility will address the resource concerns of inadequate supply of water for livestock or wildlife, habitat degradation, water quality, and undesirable plant productivity and health. The watering facility is placed on a properly prepared foundation with all required materials, plumbing and vegetation for stabilizing disturbed areas. All needed pipelines are installed using Livestock Pipeline (516). All collectors or catchments for collecting precipitation will be addressed by using Water Harvesting Catchment (636). Any needed water source installation will use Water Well (642), Pumping Plant (533), Spring Development (574), or Livestock Pipeline (516) as appropriate. Areas around watering facilities where animal concentrations or overflow from the watering facility will cause resource concerns will be protected by using Heavy Use Area Protection (561) as appropriate. All fencing will use Fence (382).

Feature Measure: Capacity in Gallons

Scenario Unit: Gallons

Scenario Typical Size: 750.00

Scenario Total Cost: $2,936.95

Scenario Cost/Unit: $3.92

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	2	$5.04
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	6	$397.08
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	6	$152.16
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	6	$263.22
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	7	$200.97
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	6	$182.16
Materials						
Wildlife Escape Ramp	242	Pool size 15' x 30', for small mammals less than one pound.	Each	$76.20	1	$76.20
Tank, Galvanized Steel Livestock, > 300 - 1,000 gallon	1068	Includes tank materials and float valve	Gallons	$1.13	750	$847.50
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$23.32	2	$46.64
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$134.97	0.01	$1.35
Mobilization						

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 614 - Watering Facility

Scenario: #134 - Permanent Drinking or Storage, Capacity greater than 1000 to 5000 Gallons

Scenario Description:

A permanent watering facility as a means for providing controlled access to drinking water for livestock or wildlife constructed of approved materials with greater than 1,000 to 5,000 gallons of capacity that stores adequate quantity and quality of water for storage or direct drinking access. The watering facility will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. The watering facility will address the resource concerns of inadequate supply of water for livestock or wildlife, habitat degradation, water quality, and undesirable plant productivity and health.

Before Situation:

This practice applies to all land uses where there is a need for a watering facility for livestock or wildlife, where there is a source of water that is adequate in quantity and quality for the purpose, and where soils and topography are suitable for a facility to provide controlled access to drinking water for livestock or wildlife to provide daily water requirements, improve animal distribution to better utilize grazing resources, provide a water source that is an alternative to a sensitive resource.

After Situation:

A permanent watering facility as a means for providing controlled access to drinking water for livestock or wildlife constructed of approved materials with a capacity of greater than 1,000 to 5,000 gallons of capacity, installed with all tank materials, tank plumbing and float valve, that stores adequate quantity and quality of water for storage or direct drinking access. The watering facility will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. The watering facility will address the resource concerns of inadequate supply of water for livestock or wildlife, habitat degradation, water quality, and undesirable plant productivity and health. The watering facility is placed on a properly prepared foundation with all required materials, plumbing and vegetation for stabilizing disturbed areas. All needed pipelines are installed using Livestock Pipeline (516). All collectors or catchments for collecting precipitation will be addressed by using Water Harvesting Catchment (636). Any needed water source installation will use Water Well (642), Pumping Plant (533), Spring Development (574), or Livestock Pipeline (516) as appropriate. Areas around watering facilities where animal concentrations or overflow from the watering facility will cause resource concerns will be protected by using Heavy Use Area Protection (561) as appropriate. All fencing will use Fence (382).

Feature Measure: Capacity in Gallons

Scenario Unit: Gallons

Scenario Typical Size: 2,000.00

Scenario Total Cost: $5,523.83

Scenario Cost/Unit: $2.76

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	4	$2,005.00
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	4	$10.08
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	8	$529.44
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	8	$202.88
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	8	$350.96
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	9	$258.39
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	8	$242.88
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	7	$202.02
Wildlife Escape Ramp	242	Pool size 15' x 30', for small mammals less than one pound.	Each	$76.20	1	$76.20
Tank, Galvanized Steel Bottomless Livestock, <= 6,000 gallon	1069	Includes tank materials, shipping, and float valve, no liner	Gallons	$0.44	2000	$880.00

Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$134.97	0.01	$1.35
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 614 - Watering Facility

Scenario: #135 - Permanent Drinking or Storage, Capacity greater than 5000 Gallons

Scenario Description:

A permanent watering facility as a means for providing controlled access to drinking water for livestock or wildlife constructed of approved materials with greater than 5,000 gallons of capacity that stores adequate quantity and quality of water for storage or direct drinking access. The watering facility will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. The watering facility will address the resource concerns of inadequate supply of water for livestock or wildlife, habitat degradation, water quality, and undesirable plant productivity and health.

Before Situation:

This practice applies to all land uses where there is a need for a watering facility for livestock or wildlife, where there is a source of water that is adequate in quantity and quality for the purpose, and where soils and topography are suitable for a facility to provide controlled access to drinking water for livestock or wildlife to provide daily water requirements, improve animal distribution to better utilize grazing resources, provide a water source that is an alternative to a sensitive resource.

After Situation:

A permanent watering facility as a means for providing controlled access to drinking water for livestock or wildlife constructed of approved materials with a capacity of greater than 5,000 gallons of capacity, installed with all tank materials, tank plumbing and float valve, that stores adequate quantity and quality of water for storage or direct drinking access. The watering facility will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. The watering facility will address the resource concerns of inadequate supply of water for livestock or wildlife, habitat degradation, water quality, and undesirable plant productivity and health. The watering facility is placed on a properly prepared foundation with all required materials, plumbing and vegetation for stabilizing disturbed areas. All needed pipelines are installed using Livestock Pipeline (516). All collectors or catchments for collecting precipitation will be addressed by using Water Harvesting Catchment (636). Any needed water source installation will use Water Well (642), Pumping Plant (533), Spring Development (574), or Livestock Pipeline (516) as appropriate. Areas around watering facilities where animal concentrations or overflow from the watering facility will cause resource concerns will be protected by using Heavy Use Area Protection (561) as appropriate. All fencing will use Fence (382).

Feature Measure: Capacity in Gallons

Scenario Unit: Gallons

Scenario Typical Size: 10,000.00

Scenario Total Cost: $10,704.54

Scenario Cost/Unit: $1.07

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	7	$3,508.75
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	13	$32.76
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	12	$794.16
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	12	$304.32
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	12	$526.44
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	13	$373.23
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	12	$364.32
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	12	$583.20
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	13	$375.18
Wildlife Escape Ramp	242	Pool size 15' x 30', for small mammals less than one pound.	Each	$76.20	1	$76.20

Tank, Galvanized Steel Bottomless Livestock, > 6,000 gallon	1070	Includes tank materials, shipping, and float valve, no liner	Gallons	$0.30	10000	$3,000.00
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$134.97	0.01	$1.35
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 614 - Watering Facility

Scenario: #136 - Water Ramp, Rock on Geotextile

Scenario Description:

A permanent watering facility-water ramp as a means for providing drinking water by storing or providing controlled access for livestock or wildlife constructed of approved materials consisting of rock and or gravel surfacing on geotextile fabric foundation. The watering facility will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. The watering facility includes all materials, equipment, labor and needed vegatation of disturbed areas to install the surfacing material and will address the resource concerns of inadequate water, soil erosion, water quality degradation and undesirable plant productivity and health.

Before Situation:

This practice applies to all land uses where there is a need for a watering facility for livestock or wildlife, where there is a source of water that is adequate in quantity and quality for the purpose, and where soils and topography are suitable for a facility to provide controlled access to drinking water for livestock or wildlife to provide daily water requirements, improve animal distribution to better utilize grazing resources, provide a water source that is an alternative to a sensitive resource.

After Situation:

A permanent watering facility-water ramp as a means for providing drinking water by storing or providing controlled access for livestock or wildlife constructed of approved materials consisting of 640 square feet of rock and or gravel surfacing on 84 square yards of geotextile fabric foundation for livestock or wildlife constructed of approved materials for providing controlled access to drinking water. The watering facility will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. The watering facility will address the resource concerns of inadequate supply of water for livestock or wildlife, habitat degradation, water quality, and undesirable plant productivity and health. The watering facility includes all materials, equipment, and labor to install the surfacing material and any needed vegetation for stabilizing disturbed areas. Any needed water source installation will use Water Well (642), Pumping Plant (533), Spring Development (574), Pond (378), or Livestock Pipeline (516) as appropriate. All fencing will use Fence (382).

Feature Measure: Area of Ramp

Scenario Unit: Square Feet

Scenario Typical Size: 640.00

Scenario Total Cost: $1,262.30

Scenario Cost/Unit: $1.97

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	24	$60.48
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yards	$0.87	12	$10.44
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	5	$143.55
Materials						
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$23.32	12	$279.84
Geotextile, non-woven, heavy weight	1210	Non-woven greater than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	$1.89	84	$158.76
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$134.97	0.01	$1.35
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	2	$607.88

Practice: 614 - Watering Facility

Scenario: #137 - Water Ramp, Rock in GeoCell on Geotextile

Scenario Description:

A permanent watering facility-water ramp as a means for providing drinking water by storing or providing controlled access for livestock or wildlife constructed of approved materials consisting of rock and or gravel surfacing in cellar containment grid place on geotextile fabric foundation. The watering facility will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. The watering facility includes all materials, equipment, labor, and needed vegatation of disturbed areas to install the surfacing material and will address the resource concerns of inadequate water, soil erosion, water quality degradation and undesirable plant productivity and health.

Before Situation:

This practice applies to all land uses where there is a need for a watering facility for livestock or wildlife, where there is a source of water that is adequate in quantity and quality for the purpose, and where soils and topography are suitable for a facility to provide controlled access to drinking water for livestock or wildlife to provide daily water requirements, improve animal distribution to better utilize grazing resources, provide a water source that is an alternative to a sensitive resource.

After Situation:

A permanent watering facility-water ramp as a means for providing drinking water by storing or providing controlled access for livestock or wildlife constructed of approved materials consisting of 640 square feet of rock and or gravel surfacing in 72 square yards of 4 inch cellar containment grid on 84 square yards of geotextile fabric foundation for livestock or wildlife constructed of approved materials for providing controlled access to drinking water. The watering facility will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. The watering facility will address the resource concerns of inadequate supply of water for livestock or wildlife, habitat degradation, water quality, and undesirable plant productivity and health. The watering facility includes all materials, equipment, and labor to install the surfacing material and any needed vegetation for stabilizing disturbed areas. Any needed water source installation will use Water Well (642), Pumping Plant (533), Spring Development (574), Pond (378), or Livestock Pipeline (516) as appropriate. All fencing will use Fence (382).

Feature Measure: Area of Ramp

Scenario Unit: Square Feet

Scenario Typical Size: 640.00

Scenario Total Cost: $2,846.12

Scenario Cost/Unit: $4.45

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	24	$60.48
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yards	$0.87	12	$10.44
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	7	$200.97
Materials						
GeoCell, 4 inch	1054	4-inch thick cellular confinement system, three-dimensional, expandable panels made from high-density polyethylene (HDPE), polyester or another polymer material. Includes materials, labor and equipment for the geocell only, does not include backfill	Square Yard	$21.20	72	$1,526.40
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$23.32	12	$279.84
Geotextile, non-woven, heavy weight	1210	Non-woven greater than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	$1.89	84	$158.76
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$134.97	0.01	$1.35
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	2	$607.88

Practice: 614 - Watering Facility

Scenario: #138 - Above ground poly storage tank <300 gallons

Scenario Description:

A permanent watering facility constructed of approved materials having <300 gallons of water storage capacity for an adequate quantity and quality of water in situations where a lower capacity water supply source such as a spring or solar pump is the only feasible water source and backup capacity is needed during peak water demand periods. All watering facilities will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. Payment includes materials and labor costs for installing the storage tank. A stabilized area under and around the watering facility is not included and must be addressed through an associated practice of Heavy Use Area Protection (561). This watering facility will address the resource concerns of inadequate supply of water for livestock, habitat degradation, water quality, and undesirable plant productivity and health.

Before Situation:

This practice applies to all land uses where there is a need for new or improved watering facilities for livestock and or wildlife, where water is not available in sufficient quantities at specific locations, and habitat, water quality, or plant productivity and health needs to be improved.

After Situation:

A permanent watering facility with water storage capacity of <300 gallons is typically installed to provide adequate water storage capacity to ensure an adequate supply and quality of water for livestock or wildlife. Installation facilitates improved plant productivity and health, water quality, and habitat. All watering facilities are constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation and placed on a properly prepared foundation with required plumbing. All needed pipelines are installed using Pipeline (516). Any needed vegetation of disturbed areas will use Critical Area Planting (342). All collectors or catchments for collecting precipitation will be addressed by using Water Harvesting Catchment (636). Any needed water source installation will use Water Well (642), Pumping Plant (533), Spring Development (574), or Pipeline (516) as appropriate. Areas around watering facilities where animal concentrations will cause resource concerns will be protected by using Heavy Use Area Protection (561) as appropriate.

Feature Measure: number of Tanks

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $1,594.23

Scenario Cost/Unit: $1,594.23

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	2	$132.36
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	3	$76.08
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	3	$86.13
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	2	$80.26
Materials						
Wildlife Escape Ramp	242	Pool size 15' x 30', for small mammals less than one pound.	Each	$76.20	1	$76.20
Tank, Poly Enclosed Storage, <= 300 gallon	1073	Water storage tanks. Includes materials and shipping only.	Gallons	$2.18	160	$348.80
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.29	13	$29.77
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 614 - Watering Facility

Scenario: #139 - Above ground poly storage tank 300 - 1000 gallons

Scenario Description:

A permanent watering facility constructed of approved materials having 300 to 1,000 gallons of water storage capacity for an adequate quantity and quality of water in situations where a lower capacity water supply source such as a spring or solar pump is the only feasible water source and backup capacity is needed during peak water demand periods. All watering facilities will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. Payment includes materials and labor costs for installing the storage tank. A stabilized area under and around the watering facility is not included and must be addressed through an associated practice of Heavy Use Area Protection (561). This watering facility will address the resource concerns of inadequate supply of water for livestock, habitat degradation, water quality, and undesirable plant productivity and health.

Before Situation:

This practice applies to all land uses where there is a need for new or improved watering facilities for livestock and or wildlife, where water is not available in sufficient quantities at specific locations, and habitat, water quality, or plant productivity and health needs to be improved.

After Situation:

A permanent watering facility with water storage capacity of 300 to 1,000 gallons is typically installed to provide adequate water storage capacity to ensure an adequate supply and quality of water for livestock or wildlife. Installation facilitates improved plant productivity and health, water quality, and habitat. All watering facilities are constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation and placed on a properly prepared foundation with required plumbing. All needed pipelines are installed using Pipeline (516). Any needed vegetation of disturbed areas will use Critical Area Planting (342). All collectors or catchments for collecting precipitation will be addressed by using Water Harvesting Catchment (636). Any needed water source installation will use Water Well (642), Pumping Plant (533), Spring Development (574), or Pipeline (516) as appropriate. Areas around watering facilities where animal concentrations will cause resource concerns will be protected by using Heavy Use Area Protection (561) as appropriate.

Feature Measure: Number of tanks

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $2,200.29

Scenario Cost/Unit: $2,200.29

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	2	$132.36
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	3	$76.08
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	3	$86.13
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	2	$60.72
Materials						
Wildlife Escape Ramp	242	Pool size 15' x 30', for small mammals less than one pound.	Each	$76.20	1	$76.20
Tank, Poly enclosed Storage, 300-1000 gal	1074	Water storage tanks. Includes materials and shipping only.	Gallons	$1.68	580	$974.40
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.29	13	$29.77
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 614 - Watering Facility

Scenario: #140 - Above ground poly storage tank 1000 - 3000 gallons

Scenario Description:

A permanent watering facility constructed of approved materials having 1,000 to 3,000 gallons of water storage capacity for an adequate quantity and quality of water in situations where a lower capacity water supply source such as a spring or solar pump is the only feasible water source and backup capacity is needed during peak water demand periods. All watering facilities will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. Payment includes materials and labor costs for installing the storage tank. A stabilized area under and around the watering facility is not included and must be addressed through an associated practice of Heavy Use Area Protection (561). This watering facility will address the resource concerns of inadequate supply of water for livestock, habitat degradation, water quality, and undesirable plant productivity and health.

Before Situation:

This practice applies to all land uses where there is a need for new or improved watering facilities for livestock and or wildlife, where water is not available in sufficient quantities at specific locations, and habitat, water quality, or plant productivity and health needs to be improved.

After Situation:

to ensure an adequate supply and quality of water for livestock or wildlife. Installation facilitates improved plant productivity and health, water quality, and habitat. All watering facilities are constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation and placed on a properly prepared foundation with required plumbing. All needed pipelines are installed using Pipeline (516). Any needed vegetation of disturbed areas will use Critical Area Planting (342). All collectors or catchments for collecting precipitation will be addressed by using Water Harvesting Catchment (636). Any needed water source installation will use Water Well (642), Pumping Plant (533), Spring Development (574), or Pipeline (516) as appropriate. Areas around watering facilities where animal concentrations will cause resource concerns will be protected by using Heavy Use Area Protection (561) as appropriate.

Feature Measure: Number of tanks

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $4,175.89

Scenario Cost/Unit: $4,175.89

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	2	$132.36
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	3	$76.08
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	3	$86.13
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	2	$60.72
Materials						
Wildlife Escape Ramp	242	Pool size 15' x 30', for small mammals less than one pound.	Each	$76.20	1	$76.20
Tank, Poly Enclosed Storage, >1,000	1075	Water storage tanks. Includes materials and shipping only.	Gallons	$1.18	2500	$2,950.00
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.29	13	$29.77
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 614 - Watering Facility

Scenario: #141 - Tire Trough

Scenario Description:

A permanent watering facility for livestock and/or wildlife constructed from tires that stores adequate quantity and quality of water for storage and/or direct drinking access. All watering facilities will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. This watering facility will address the resource concerns of inadequate supply of water for livestock and/or wildlife, habitat degradation, water quality, and undesirable plant productivity and health.

Before Situation:

There is insufficient water to meet livestock or wildlife watering needs at a site. Animals may have access to streams or ponds, need to travel a long distance to available water or pasture use and rotation may be affected. This practice applies to all land uses where there is a need for new or improved watering facilities for livestock and/or wildlife where water is not available in sufficient quantities at specific locations; and where habitat, water quality, plant productivity and health needs to be improved. Resource concerns include, but may not be limited to, Plant Condition and Quality, Soil Erosion and Stream Habitat/Water Quality.

After Situation:

A permanent watering facility using a 10' diameter tire is installed with all tank materials, tank plumbing and float valve, to provide adequate water storage capacity to ensure an adequate supply and quality of water for livestock or wildlife for storage and/or direct drinking access and provides improved plant productivity and health, water quality, and habitat. All watering facilities are constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation and placed on a properly prepared foundation with required plumbing. All needed pipelines are installed using Livestock Pipeline (516). Any needed vegetation of disturbed areas will use Critical Area Planting (342). All collectors or catchments for collecting precipitation will be addressed by using Water Harvesting Catchment (636). Any needed water source installation will use Water Well (642), Pumping Plant (533), Spring Development (574), or Livestock Pipeline (516) as appropriate. Areas around watering facilities where animal concentrations or overflow from the watering facility will cause resource concerns will be protected by using Heavy Use Area Protection (561) as appropriate.

Feature Measure: Capacity in Gallons

Scenario Unit: Gallons

Scenario Typical Size: 981.00

Scenario Total Cost: $2,793.73

Scenario Cost/Unit: $2.85

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formless, non reinforced	36	Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$220.05	0.7	$154.04
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	6	$397.08
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	2	$50.72
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	13	$373.23
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	7	$212.52
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	2	$97.20
Materials						
Freeze Proof Hydrant, <= 3 ft. bury	240	Freeze Proof Hydrant, 3 foot or less bury. Materials only.	Each	$160.26	1	$160.26
Wildlife Escape Ramp	242	Pool size 15' x 30', for small mammals less than one pound.	Each	$76.20	1	$76.20
Tank, Tire, 10' diameter	287	Tire, includes material cost for tank and shipping. Labor and other appurtenance costs not included.	Each	$1,058.41	1	$1,058.41
Dimension Lumber, Treated	1044	Treated dimension lumber with nominal thickness equal or less than 2 inches. Includes lumber and fasteners	Board Feet	$1.79	24	$42.96
Post, Wood, CCA Treated, 4-5 in. X 7 ft.	1050	Wood Post, Line 4-5 inch dia. X 7 feet, CCA Treated. Includes materials and shipping only.	Each	$14.34	2	$28.68
Tank, Float Valve Assembly	1077	Float Valve, Stem, Swivel, Float Ball	Each	$102.79	1	$102.79
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$23.32	1.7	$39.64

Practice: 620 - Underground Outlet

Scenario: #1 - 6 inch corrugated plastic tubing or smaller

Scenario Description:

Install 500 feet of 6' or smaller corrugated plastic tubing to convey stormwater from one location to a suitable and stable outlet. Trench is excavated approximately 54' deep and 15' wide by trencher. Costs include 6' HDPE corrugated single wall plastic tubing, one 8' Perforated Riser Inlet, trench excavation, trench backfill, rodent guard and CMP at outlet. Not all or different appurtenances may be required in some situations. This practice is often installed in conjunction with terraces, diversions, sediment control basins, waterways or similar practices.

Before Situation:

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds 'T' from farm fields and other locations. Also, roof runoff or surface runoff that becomes contaminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated or perimeter drain discharge must be delivered to an outlet.

After Situation:

Field system meets 'T' or 'clean' storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

Feature Measure: Length of Conduit

Scenario Unit: Feet

Scenario Typical Size: 500.00

Scenario Total Cost: $3,978.52

Scenario Cost/Unit: $7.96

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	8	$1,044.08
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$56.88	4	$227.52
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	8	$242.88
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	8	$321.04
Materials						
Inlet, riser, 8 in.	1262	Riser, polymer, complete vertical perforated UGO inlet with Tee, orifice plate if needed, 8 inch diameter. Materials only.	Each	$154.23	1	$154.23
Pipe, CMP, 18-16 gauge, weight priced	1322	18 and 16 gauge galvanized helical corrugated metal pipe priced by the weight of the pipe materials. Materials only.	Pound	$2.00	63	$126.00
Pipe, HDPE, corrugated single wall, <= 12 in. weight priced Compound	1380	High Density Polyethylene (HDPE) compound manufactured into single wall corrugated pipe or tubing. Materials only.	Pound	$2.09	380	$794.20
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 620 - Underground Outlet

Scenario: #2 - 8 inch corrugated plastic tubing

Scenario Description:

Install 500 feet of 8' corrugated plastic tubing to convey stormwater from one location to a suitable and stable outlet. Trench is excavated approximately 54' deep and 15' wide by trencher. Costs include 8' PE corrugated single wall plastic tubing, one 10' Perforated Riser Inlet, trench excavation, trench backfill, rodent guard and CMP at outlet. Not all, or different appurtenances may be required in some situations. This practice is often installed in conjunction with terraces, diversions, sediment control basins, waterways or similar practices.

Before Situation:

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds 'T' from farm fields and other locations. Also, roof runoff or surface runoff that becomes contaminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated or perimeter drain discharge must be delivered to an outlet.

After Situation:

Field system meets 'T' or 'clean' storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606).

Feature Measure: Length of Conduit

Scenario Unit: Feet

Scenario Typical Size: 500.00

Scenario Total Cost: $4,598.94

Scenario Cost/Unit: $9.20

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	8	$1,044.08
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$56.88	4	$227.52
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	8	$242.88
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	8	$321.04
Materials						
Inlet, riser, 10 in.	1263	Riser, polymer, complete vertical perforated UGO inlet with Tee, orifice plate if needed, 10 inch diameter. Materials only.	Each	$208.47	1	$208.47
Pipe, CMP, 18-16 gauge, weight priced	1322	18 and 16 gauge galvanized helical corrugated metal pipe priced by the weight of the pipe materials. Materials only.	Pound	$2.00	77	$154.00
Pipe, HDPE, corrugated single wall, <= 12 in. weight priced Compound	1380	High Density Polyethylene (HDPE) compound manufactured into single wall corrugated pipe or tubing. Materials only.	Pound	$2.09	637.5	$1,332.38
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 620 - Underground Outlet

Scenario: #3 - 10 inch corrugated plastic tubing

Scenario Description:
Install 500 feet of 10' corrugated plastic tubing to convey stormwater from one location to a suitable and stable outlet. Trench Excavation is 58' deep and 28' wide. Costs include 10' corrugated plastic tubing, one 12' Perforated PVC Riser Inlets, trench excavation, trench backfill, rodent guard and CMP at outlet. Not all, or different appurtenances may be required in some situations. This practice is often installed in conjunction with terraces, diversions, sediment control basins, waterways or simlar practices.

Before Situation:
Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds 'T' from farm fields and other locations. Also, roof runoff or surface runoff that becomes contminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.

After Situation:
Field system meets 'T' or 'clean' storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

Feature Measure: Length of Conduit

Scenario Unit: Feet

Scenario Typical Size: 500.00

Scenario Total Cost: $5,874.76

Scenario Cost/Unit: $11.75

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	210	$529.20
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$56.88	5	$284.40
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	5	$151.80
Materials						
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$23.32	42	$979.44
Inlet, riser, 12 in.	1264	Riser, polymer, complete vertical perforated UGO inlet with Tee, orifice plate if needed, 12 inch diameter. Materials only.	Each	$651.27	1	$651.27
Pipe, CMP, 18-16 gauge, weight priced	1322	18 and 16 gauge galvanized helical corrugated metal pipe priced by the weight of the pipe materials. Materials only.	Pound	$2.00	94	$188.00
Pipe, HDPE, corrugated single wall, <= 12 in. weight priced Compound	1380	High Density Polyethylene (HDPE) compound manufactured into single wall corrugated pipe or tubing. Materials only.	Pound	$2.09	967.5	$2,022.08
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 620 - Underground Outlet

Scenario: #4 - 12 inch corrugated plastic tubing or larger

Scenario Description:
Install 500 feet of 12' or larger corrugated plastic tubing to convey stormwater from one location to a suitable and stable outlet. Trench Excavation is 58' deep and 28' wide. Costs include 12' corrugated plastic tubing, one 12' Perforated PVC Riser Inlets, trench excavation, trench backfill, rodent guard and CMP at outlet. Not all, or different appurtenances may be required in some situations. This practice is often installed in conjunction with terraces, diversions, sediment control basins, waterways or simlar practices.

Before Situation:
Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds 'T' from farm fields and other locations. Also, roof runoff or surface runoff that becomes contminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.

After Situation:
Field system meets 'T' or 'clean' storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

Feature Measure: Length of Conduit

Scenario Unit: Feet

Scenario Typical Size: 500.00

Scenario Total Cost: $6,606.26

Scenario Cost/Unit: $13.21

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	210	$529.20
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$56.88	5	$284.40
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	5	$151.80
Materials						
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$23.32	42	$979.44
Inlet, riser, 12 in.	1264	Riser, polymer, complete vertical perforated UGO inlet with Tee, orifice plate if needed, 12 inch diameter. Materials only.	Each	$651.27	1	$651.27
Pipe, CMP, 18-16 gauge, weight priced	1322	18 and 16 gauge galvanized helical corrugated metal pipe priced by the weight of the pipe materials. Materials only.	Pound	$2.00	94	$188.00
Pipe, HDPE, corrugated single wall, <= 12 in. weight priced Compound	1380	High Density Polyethylene (HDPE) compound manufactured into single wall corrugated pipe or tubing. Materials only.	Pound	$2.09	1317.5	$2,753.58
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 620 - Underground Outlet

Scenario: #5 - 6 inch pipe conduit

Scenario Description:

Install 500 feet of 6' plastic pipe or other to convey stormwater from one location to a suitable and stable outlet in a heavy traffic area. Trench is excavated 52' deep and 24' wide by hydraulic track excavator. Costs include 6' schedule 40 pipe, Precast concrete drop inlet with steel grate or slotted intake, trench excavation, trench backfill, rodent guard and 8' CMP at outlet. Not all, or different appurtenances may be required in some situations. This practice is often installed in conjunction with ag waste systems, sediment control basins, roof runoff or similar practices.

Before Situation:

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds 'T' from farm fields and other locations. Also, roof runoff or surface runoff that becomes contminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated or perimeter drain discharge must be delivered to an outlet.

After Situation:

Field system meets 'T' or 'clean' storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste or serve as a perimeter drain outlet. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606), Roof Runoff Structure (558)

Feature Measure: Length of Conduit

Scenario Unit: Feet

Scenario Typical Size: 500.00

Scenario Total Cost: $8,056.09

Scenario Cost/Unit: $16.11

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	8	$1,044.08
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$56.88	5	$284.40
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	5	$151.80
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	8	$321.04
Materials						
Catch Basin, concrete, 2 ft.x 2 ft. x 6 ft.	1257	Catch Basin, Precast Concrete, 2 ft. square or round, cast grate, 6 ft. deep. Includes materials, equipment and labor.	Each	$961.10	1	$961.10
Pipe, CMP, 18-16 gauge, weight priced	1322	18 and 16 gauge galvanized helical corrugated metal pipe priced by the weight of the pipe materials. Materials only.	Pound	$2.00	63	$126.00
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.29	1790	$4,099.10
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 620 - Underground Outlet

Scenario: #6 - 8 -12 inch pipe conduit

Scenario Description:

Install 500 feet of 10' PVC, CMP or dual wall PE pipe to convey stormwater from one location to a suitable and stable outlet in a heavy traffic area.. Trench Excavation is 58' deep and 28' wide. Costs include 10' PVC or dual wall HDPE pipe, Precast concrete drop inlet with steel grate, trench excavation, trench backfill, rodent guard and CMP at outlet. Not all, or different appurtenances may be required in some situations. This practice is often installed in conjunction with ag waste systems, sediment control basins, or simlar practices.

Before Situation:

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds 'T' from farm fields and other locations. Also, roof runoff or surface runoff that becomes contminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated or perimeter drain discharge must be delivered to an outlet or perimeter drain discharge must be delivered to an outlet.

After Situation:

Field system meets 'T' or 'clean' storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste or serve as a perimeter drain outlet. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606).

Feature Measure: Length of Conduit

Scenario Unit: Feet

Scenario Typical Size: 500.00

Scenario Total Cost: $9,558.50

Scenario Cost/Unit: $19.12

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	210	$529.20
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$56.88	5	$284.40
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	8	$242.88
Materials						
Catch Basin, concrete, 2 ft.x 2 ft. x 6 ft.	1257	Catch Basin, Precast Concrete, 2 ft. square or round, cast grate, 6 ft. deep. Includes materials, equipment and labor.	Each	$961.10	1	$961.10
Pipe, CMP, 18-16 gauge, weight priced	1322	18 and 16 gauge galvanized helical corrugated metal pipe priced by the weight of the pipe materials. Materials only.	Pound	$2.00	150.4	$300.80
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.29	2695	$6,171.55
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 620 - Underground Outlet

Scenario: #7 - 15-21 inch pipe conduit

Scenario Description:

Install 500 feet of 18' dual wall HDPE or other pipe to convey storm water from one location to a suitable and stable outlet. Trench excavation is 60' deep x 36' wide. Costs include 18' HDPE pipe, Precast concrete drop inlet with steel grate or slotted intake, trench excavation, bedding material, trench backfill, rodent guard and laid up stone headwall at outlet. Not all, or different appurtenances may be required in some situations. This practice is often is installed in conjunction with diversions, water and sediment control basins, grade stabilizations, aquaculture ponds or similar practices.

Before Situation:

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds 'T' from farm fields and other locations. Also, roof runoff or surface runoff that becomes contminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated. Or in the case of use with aquaculture pond, the producer???s aquaculture pond system has one or more of the following concerns: excessive seepage or frequent release of nutrient laden aquaculture water, potential of loss of non-native aquaculture production fish species to the native environment, and/or poor growing conditions for the current aquaculture species.

After Situation:

Field system meets 'T' or 'clean' storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Aquaculture Pond, Critical Area Planting (342), Grassed Waterway (412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), Grade Stabilization Structure(410) and Subsurface Drainage (606)

Feature Measure: Length of Conduit

Scenario Unit: Feet

Scenario Typical Size: 500.00

Scenario Total Cost: $12,677.00

Scenario Cost/Unit: $25.35

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$56.88	4	$227.52
Excavation, common earth, side cast, large equipment	1227	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$1.61	330	$531.30
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	8	$242.88
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement.	Cubic Yards	$136.88	2	$273.76
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$23.32	56	$1,305.92
Catch Basin, concrete, 2 ft.x 2 ft. x 6 ft.	1257	Catch Basin, Precast Concrete, 2 ft. square or round, cast grate, 6 ft. deep. Includes materials, equipment and labor.	Each	$961.10	1	$961.10
Pipe, HDPE, corrugated double wall, GTE 15 in., soil tight, weight priced	1588	High Density Polyethylene (HDPE) compound manufactured into double wall corrugated pipe Greater Than or Equal to 15 inch diameter. Materials only.	Pound	$2.37	3215	$7,619.55
Pipe, CMP, 14-12 gauge, weight priced	1589	14 and 12 gauge galvanized helical corrugated metal pipe priced by the weight of the pipe materials. Materials only.	Pound	$0.93	480	$446.40
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 620 - Underground Outlet

Scenario: #8 - 24 inch pipe conduit

Scenario Description:

Install 500 feet of 24' dual wall HDPE or other pipe to convey stormwater from one location to a suitable and stable outlet or to move water from aquaculture pond to kettle or move water from aquaculture kettle to outlet. Trench excavation is 72' x 48' wide. Costs include 24' HDPE pipe, Precast concrete drop inlet with steel grate, 24' HDPE pipe, trench excavation, bedding material, trench backfill, rodent guard and laid up stone headwall at outlet. Not all, or different appurtenances may be required in some situations. Practice is often installed in conjunction with terraces, diversions, sediment control basins, waterways or similar practices.

Before Situation:

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds 'T' from farm fields and other locations. Also, roof runoff or surface runoff that becomes contaminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated. Or in the case of use with aquaculture pond, the producer???s aquaculture pond system has one or more of the following concerns: excessive seepage or frequent release of nutrient laden aquaculture water, potential of loss of non-native aquaculture production fish species to the native environment, and/or poor growing conditions for the current aquaculture species.

After Situation:

Field system meets 'T' or 'clean' storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Aquaculture Pond, Critical Area Planting (342), Grassed Waterway (412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606), or Grade stabilization Structure (410)

Feature Measure: Length of Conduit

Scenario Unit: Feet

Scenario Typical Size: 500.00

Scenario Total Cost: $21,847.72

Scenario Cost/Unit: $43.70

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, common earth, small equipment, 50 ft	1220	Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yards	$2.81	445	$1,250.45
Excavation, common earth, side cast, large equipment	1227	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$1.61	445	$716.45
Compaction, earthfill, vibratory plate	1260	Compaction of earthfill with a walk behind vibratory plate compactor in typical 6-8 inch thick lifts, 2 passes. Includes equipment and labor.	Cubic Yards	$2.80	2	$5.60
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	12	$364.32
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	4	$194.40
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement.	Cubic Yards	$136.88	2	$273.76
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	85	$2,580.60
Catch Basin, concrete, 3 ft. x 3 ft. x 6 ft.	1258	Catch Basin, Precast Concrete, 3 feet square or round, cast grate, 6 feet deep. Includes materials, equipment and labor.	Each	$1,874.18	1	$1,874.18
Pipe, HDPE, corrugated double wall, GTE 15 in., soil tight, weight priced	1588	High Density Polyethylene (HDPE) compound manufactured into double wall corrugated pipe Greater Than or Equal to 15 inch diameter. Materials only.	Pound	$2.37	5510	$13,058.70
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 620 - Underground Outlet

Scenario: #9 - 30 inch pipe conduit

Scenario Description:
Install 500 feet of 30' dual wall HDPE or other pipe to convey stormwater from one location to a suitable and stable outlet. Trench excavation is 72' deep x 48' wide. Costs include 30' HDPE pipe, Precast concrete drop inlet with steel grate, trench excavation, bedding material, trench backfill, rodent guard and riprap at outlet. Not all, or different appurtenances may be required in some situations.This practices is often installed in conjunction with diversions, sediment control basins, or simlar practices.

Before Situation:
Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds 'T' from farm fields and other locations. Also, roof runoff or surface runoff that becomes contminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.

After Situation:
Field system meets 'T' or 'clean' storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

Feature Measure: Length of Conduit

Scenario Unit: Feet

Scenario Typical Size: 500.00

Scenario Total Cost: $24,900.86

Scenario Cost/Unit: $49.80

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$56.88	8	$455.04
Excavation, common earth, side cast, large equipment	1227	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$1.61	444	$714.84
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	12	$364.32
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement.	Cubic Yards	$136.88	2	$273.76
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$23.32	80	$1,865.60
Catch Basin, concrete, 3 ft. x 3 ft. x 6 ft.	1258	Catch Basin, Precast Concrete, 3 feet square or round, cast grate, 6 feet deep. Includes materials, equipment and labor.	Each	$1,874.18	1	$1,874.18
Pipe, HDPE, corrugated double wall, GTE 15 in., soil tight, weight priced	1588	High Density Polyethylene (HDPE) compound manufactured into double wall corrugated pipe Greater Than or Equal to 15 inch diameter. Materials only.	Pound	$2.37	7715	$18,284.55
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 620 - Underground Outlet

Scenario: #10 - 36 inch pipe conduit or larger

Scenario Description:
Install 500 feet of 36' or larger hdpe dual wall or other pipe to convey stormwater from one location to a suitable and stable outlet. Trench excavation is 72' deep x 54' wide. Costs include 36' HDPE pipe, Precast concrete drop inlet with steel grate or slotted intake, trench excavation, bedding material, trench backfill, rodent guard and laid up stone headwall at outlet. Not all, or different appurtenances may be required in some situations. This practice is often installed in conjunction with, diversions, sediment control basins, or simlar practices.

Before Situation:
Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds 'T' from farm fields and other locations. Also, roof runoff or surface runoff that becomes contminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.

After Situation:
Field system meets 'T' or 'clean' storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), Grade Stabilization (410), and Subsurface Drainage (606)

Feature Measure: Length of Conduit

Scenario Unit: Feet

Scenario Typical Size: 500.00

Scenario Total Cost: $31,752.11

Scenario Cost/Unit: $63.50

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$56.88	12	$682.56
Excavation, common earth, side cast, large equipment	1227	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$1.61	500	$805.00
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	16	$485.76
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement.	Cubic Yards	$136.88	3	$410.64
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$23.32	125	$2,915.00
Catch Basin, concrete, 3 ft. x 3 ft. x 6 ft.	1258	Catch Basin, Precast Concrete, 3 feet square or round, cast grate, 6 feet deep. Includes materials, equipment and labor.	Each	$1,874.18	1	$1,874.18
Pipe, HDPE, corrugated double wall, GTE 15 in., soil tight, weight priced	1588	High Density Polyethylene (HDPE) compound manufactured into double wall corrugated pipe Greater Than or Equal to 15 inch diameter. Materials only.	Pound	$2.37	9920	$23,510.40
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 620 - Underground Outlet

Scenario: #11 - Intake Riser and short offset outlet

Scenario Description:

Install an 8 inch perforated riser and 20 feet of 6' PVC pipe as an offset to connect to an existing tile line that has adequate capacity. Practice will convey stormwater from one location to a suitable and stable outlet. Trench is excavated approximately 54' deep and 24' wide by a small backhoe. Costs include 6' PVC pipe, 8' Perforated PVC Riser Inlet, tee connection, trench excavation, and trench backfill. Not all, or different appurtenances may be required in some situations. This practice is often installed in conjunction with terraces, diversions, sediment control basins, waterways or simlar practices.

Before Situation:

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds 'T' from farm fields and other locations. Also, roof runoff or surface runoff that becomes contminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.

After Situation:

Field system meets 'T' or 'clean' storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

Feature Measure: Number of Risers

Scenario Unit: Each

Scenario Typical Size: 3.00

Scenario Total Cost: $1,880.13

Scenario Cost/Unit: $626.71

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hydraulic Excavator, .5 CY	930	Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included.	Hours	$101.18	6	$607.08
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	6	$182.16
Materials						
Inlet, riser, 8 in.	1262	Riser, polymer, complete vertical perforated UGO inlet with Tee, orifice plate if needed, 8 inch diameter. Materials only.	Each	$154.23	3	$462.69
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.29	141.6	$324.26
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 620 - Underground Outlet

Scenario: #62 - Aquaculture Pond Outlet

Scenario Description:
Install 500 feet of 14' smooth wall HDPE to move water from aquaculture pond to kettle and move water from aquaculture kettle to outlet. Trench excavation is 60' deep x 36' wide. Costs include 14' smooth walled HDPE pipe, trench excavation, trench backfill. Not all, or different appurtenances may be required in some situations. This practice is installed in conjunction with aquaculture ponds.

Before Situation:
This scenario is designed to create an outlet from an aquaculture pond to a harvest kettle and from the kettle to a stable outlet. The producer???s aquaculture pond system has one or more of the following concerns: excessive seepage or frequent release of nutrient laden aquaculture water, potential of loss of non-native aquaculture production fish species to the native environment, and/or poor growing conditions for the current aquaculture species.

After Situation:
A sufficient outlet will be created to safely convey fish from the aquaculture pond to the harvest kettle and the water from the kettle will be conveyed to a stable outlet. The length to outlet is dependent on site conditions. The producer???s resulting aquaculture pond system will have solved one or more of the following concerns: excessive seepage or frequent release of nutrient laden aquaculture water, potential of loss of non-native aquaculture production fish species to the native environment, and/or poor growing conditions for the current aquaculture species. Associated practices are Aquaculture Pond (397), Grade Stabilization (410) for pipe outlet protection, Waste Separation Facility (632).

Feature Measure: Length of conduit

Scenario Unit: Linear Feet

Scenario Typical Size: 500.00

Scenario Total Cost: $22,424.30

Scenario Cost/Unit: $44.85

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$56.88	4	$227.52
Excavation, common earth, side cast, large equipment	1227	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$1.61	331	$532.91
Fuser for HDPE Pipe	1383	Fusing machine for 1 to 12 inch diameter HDPE pipe joints. Equipment costs only. Does not include labor.	Hours	$28.59	8	$228.72
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	8	$350.96
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	12	$364.32
Materials						
Inlet, riser, 12 in.	1264	Riser, polymer, complete vertical perforated UGO inlet with Tee, orifice plate if needed, 12 inch diameter. Materials only.	Each	$651.27	3	$1,953.81
Pipe, HDPE, smooth wall, weight priced	1379	High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only.	Pound	$3.59	4845	$17,393.55
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	2	$607.88
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 620 - Underground Outlet

Scenario: #63 - Blind Inlet for Water Quality

Scenario Description:
Install an excavated earthen box with perforated collector tubing placed in the bottom and filled to the surface with bedding material and sand to direct surface flow into a 'main line' or subsurface drain. Typically installed in low areas to replace surface risers, thus reducing direct flow of sediment into tile and out to stream. Costs include the collection pipe, excavation, gravel and sand layers. This practice can be installed in conjunction with small drainage area WASCOBs or similar practices. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

Before Situation:
Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds 'T' from farm fields and other locations enters surface riser.

After Situation:
Runoff water is filtered through blind inlet before out letting through tile. Excessive sedimentation and soil erosion is controlled.

Feature Measure: Volume of Aggregate

Scenario Unit: Cubic Yards

Scenario Typical Size: 23.00

Scenario Total Cost: $2,828.44

Scenario Cost/Unit: $122.98

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, common earth, small equipment, 50 ft	1220	Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yards	$2.81	22	$61.82
Excavation, common earth, side cast, large equipment	1227	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$1.61	22	$35.42
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	2	$97.20
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	8	$230.88
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	15	$455.40
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.29	75.5	$172.90
Pipe, HDPE, corrugated single wall, <= 12 in. weight priced Compound	1380	High Density Polyethylene (HDPE) compound manufactured into single wall corrugated pipe or tubing. Materials only.	Pound	$2.09	7.6	$15.88
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 620 - Underground Outlet

Scenario: #139 - 6 inch or less pipe

Scenario Description:
Install 500 feet of 6' approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. Trench is excavated 52' deep and 24' wide by hydraulic track excavator. Costs include 6' SDR-35 pipe, Precast concrete drop inlet with steel grate, trench excavation, trench backfill, rodent guard and laid up stone headwall at outlet. This practice is often installed in conjunction with terraces, diversions, sediment control basins, waterways or simlar practices.

Before Situation:
Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds 'T' from farm fields and other locations. Also, roof runoff or surface runoff that becomes contminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.

After Situation:
Field system meets 'T' or 'clean' storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

Feature Measure: Length of Conduit

Scenario Unit: Feet

Scenario Typical Size: 500.00

Scenario Total Cost: $6,183.64

Scenario Cost/Unit: $12.37

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, common earth, small equipment, 50 ft	1220	Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yards	$2.81	170	$477.70
Excavation, common earth, side cast, large equipment	1227	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$1.61	170	$273.70
Compaction, earthfill, vibratory plate	1260	Compaction of earthfill with a walk behind vibratory plate compactor in typical 6-8 inch thick lifts, 2 passes. Includes equipment and labor.	Cubic Yards	$2.80	2	$5.60
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	2	$97.20
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement.	Cubic Yards	$136.88	1	$136.88
Catch Basin, concrete, 2 ft.x 2 ft. x 6 ft.	1257	Catch Basin, Precast Concrete, 2 ft. square or round, cast grate, 6 ft. deep. Includes materials, equipment and labor.	Each	$961.10	1	$961.10
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.29	1180	$2,702.20
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 620 - Underground Outlet

Scenario: #140 - 6 inch or less, Riser

Scenario Description:

Install 500 feet of 6' approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. Trench is excavated approximately 54'' deep and 15' wide by trencher. Costs include 6' HDPE corrugated single wall plastic tubing, 8' Perforated PVC Riser Inlet, trench excavation, trench backfill, rodent guard and laid up stone headwall at outlet. This practice is often installed in conjunction with terraces, diversions, sediment control basins, waterways or simlar practices.

Before Situation:

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds 'T' from farm fields and other locations. Also, roof runoff or surface runoff that becomes contminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.

After Situation:

Field system meets 'T' or 'clean' storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

Feature Measure: Length of Conduit

Scenario Unit: Feet

Scenario Typical Size: 500.00

Scenario Total Cost: $4,203.75

Scenario Cost/Unit: $8.41

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, common earth, small equipment, 50 ft	1220	Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yards	$2.81	105	$295.05
Trencher, wheel type	1259	Wheel type Trencher, typically 350 HP with 6 foot max depth. Equipment only.	Hours	$177.06	5	$885.30
Compaction, earthfill, vibratory plate	1260	Compaction of earthfill with a walk behind vibratory plate compactor in typical 6-8 inch thick lifts, 2 passes. Includes equipment and labor.	Cubic Yards	$2.80	2	$5.60
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	5	$151.80
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	2	$97.20
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement.	Cubic Yards	$136.88	1	$136.88
Inlet, riser, 8 in.	1262	Riser, polymer, complete vertical perforated UGO inlet with Tee, orifice plate if needed, 8 inch diameter. Materials only.	Each	$154.23	2	$308.46
Pipe, HDPE, corrugated single wall, <= 12 in. weight priced Compound	1380	High Density Polyethylene (HDPE) compound manufactured into single wall corrugated pipe or tubing. Materials only.	Pound	$2.09	380	$794.20
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 620 - Underground Outlet

Scenario: #141 - 12 inch or less

Scenario Description:
Install 500 feet of 10' approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. Trench Excavation is 58' deep and 28' wide. Costs include 10' HDPE pipe, Precast concrete drop inlet with steel grate, trench excavation, trench backfill, rodent guard and laid up stone headwall at outlet. This practice is often installed in conjunction with terraces, diversions, sediment control basins, waterways or simlar practices.

Before Situation:
Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds 'T' from farm fields and other locations. Also, roof runoff or surface runoff that becomes contminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.

After Situation:
Field system meets 'T' or 'clean' storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

Feature Measure: Length of Conduit

Scenario Unit: Feet

Scenario Typical Size: 500.00

Scenario Total Cost: $7,335.94

Scenario Cost/Unit: $14.67

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, common earth, small equipment, 50 ft	1220	Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yards	$2.81	210	$590.10
Excavation, common earth, side cast, large equipment	1227	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$1.61	210	$338.10
Compaction, earthfill, vibratory plate	1260	Compaction of earthfill with a walk behind vibratory plate compactor in typical 6-8 inch thick lifts, 2 passes. Includes equipment and labor.	Cubic Yards	$2.80	2	$5.60
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	4	$194.40
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement.	Cubic Yards	$136.88	1	$136.88
Catch Basin, concrete, 2 ft.x 2 ft. x 6 ft.	1257	Catch Basin, Precast Concrete, 2 ft. square or round, cast grate, 6 ft. deep. Includes materials, equipment and labor.	Each	$961.10	1	$961.10
Pipe, HDPE, corrugated double wall, LTE-12 in., soil tight, weight priced	1587	High Density Polyethylene (HDPE) compound manufactured into double wall corrugated pipe LTE-12 inch diameter. Materials only.	Pound	$3.10	1155	$3,580.50
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 620 - Underground Outlet

Scenario: #142 - 12 inch or less, riser

Scenario Description:

Install 500 feet of 10' approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. Trench Excavation is 58' deep and 28' wide. Costs include 10' HDPE pipe, 12' Perforated PVC Riser Inlet, trench excavation, trench backfill, rodent guard and laid up stone headwall at outlet. This practice is often installed in conjunction with terraces, diversions, sediment control basins, waterways or simlar practices.

Before Situation:

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds 'T' from farm fields and other locations. Also, roof runoff or surface runoff that becomes contminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.

After Situation:

Field system meets 'T' or 'clean' storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

Feature Measure: Length of Conduit

Scenario Unit: Feet

Scenario Typical Size: 500.00

Scenario Total Cost: $7,490.78

Scenario Cost/Unit: $14.98

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, common earth, small equipment, 50 ft	1220	Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yards	$2.81	210	$590.10
Trencher, wheel type	1259	Wheel type Trencher, typically 350 HP with 6 foot max depth. Equipment only.	Hours	$177.06	5	$885.30
Compaction, earthfill, vibratory plate	1260	Compaction of earthfill with a walk behind vibratory plate compactor in typical 6-8 inch thick lifts, 2 passes. Includes equipment and labor.	Cubic Yards	$2.80	2	$5.60
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	5	$151.80
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	4	$194.40
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement.	Cubic Yards	$136.88	1	$136.88
Inlet, riser, 10 in.	1263	Riser, polymer, complete vertical perforated UGO inlet with Tee, orifice plate if needed, 10 inch diameter. Materials only.	Each	$208.47	2	$416.94
Pipe, HDPE, corrugated double wall, LTE-12 in., soil tight, weight priced	1587	High Density Polyethylene (HDPE) compound manufactured into double wall corrugated pipe LTE-12 inch diameter. Materials only.	Pound	$3.10	1155	$3,580.50
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 620 - Underground Outlet

Scenario: #143 - 18 inch or less

Scenario Description:

Install 500 feet of 18' approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. Trench excavation is 66' deep x 39' wide. Costs include 18' HDPE pipe, Precast concrete drop inlet with steel grate, trench excavation, bedding material, trench backfill, rodent guard and laid up stone headwall at outlet. This practice is often is installed in conjunction with terraces, diversions, sediment control basins, waterways or simlar practices.

Before Situation:

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds 'T' from farm fields and other locations. Also, roof runoff or surface runoff that becomes contminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.

After Situation:

Field system meets 'T' or 'clean' storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

Feature Measure: Length of Conduit

Scenario Unit: Feet

Scenario Typical Size: 500.00

Scenario Total Cost: $13,726.99

Scenario Cost/Unit: $27.45

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, common earth, small equipment, 50 ft	1220	Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yards	$2.81	330	$927.30
Excavation, common earth, side cast, large equipment	1227	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$1.61	330	$531.30
Compaction, earthfill, vibratory plate	1260	Compaction of earthfill with a walk behind vibratory plate compactor in typical 6-8 inch thick lifts, 2 passes. Includes equipment and labor.	Cubic Yards	$2.80	2	$5.60
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	4	$194.40
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement.	Cubic Yards	$136.88	1	$136.88
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	60	$1,821.60
Catch Basin, concrete, 2 ft.x 2 ft. x 6 ft.	1257	Catch Basin, Precast Concrete, 2 ft. square or round, cast grate, 6 ft. deep. Includes materials, equipment and labor.	Each	$961.10	1	$961.10
Pipe, HDPE, corrugated double wall, GTE 15 in., soil tight, weight priced	1588	High Density Polyethylene (HDPE) compound manufactured into double wall corrugated pipe Greater Than or Equal to 15 inch diameter. Materials only.	Pound	$2.37	3215	$7,619.55
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 620 - Underground Outlet

Scenario: #144 - 24 inch or less

Scenario Description:
Install 500 feet of 24' approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. Trench excavation is 72' x 48' wide. Costs include 24' HDPE pipe, Precast concrete drop inlet with steel grate, 24' HDPE pipe, trench excavation, bedding material, trench backfill, rodent guard and laid up stone headwall at outlet. Practice is often installed in conjunction with terraces, diversions, sediment control basins, waterways or simlar practices.

Before Situation:
Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds 'T' from farm fields and other locations. Also, roof runoff or surface runoff that becomes contminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.

After Situation:
Field system meets 'T' or 'clean' storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

Feature Measure: Length of Conduit

Scenario Unit: Feet

Scenario Typical Size: 500.00

Scenario Total Cost: $20,433.44

Scenario Cost/Unit: $40.87

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, common earth, small equipment, 50 ft	1220	Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yards	$2.81	445	$1,250.45
Excavation, common earth, side cast, large equipment	1227	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$1.61	445	$716.45
Compaction, earthfill, vibratory plate	1260	Compaction of earthfill with a walk behind vibratory plate compactor in typical 6-8 inch thick lifts, 2 passes. Includes equipment and labor.	Cubic Yards	$2.80	2	$5.60
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	4	$194.40
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement.	Cubic Yards	$136.88	1	$136.88
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	85	$2,580.60
Catch Basin, concrete, 2 ft.x 2 ft. x 6 ft.	1257	Catch Basin, Precast Concrete, 2 ft. square or round, cast grate, 6 ft. deep. Includes materials, equipment and labor.	Each	$961.10	1	$961.10
Pipe, HDPE, corrugated double wall, GTE 15 in., soil tight, weight priced	1588	High Density Polyethylene (HDPE) compound manufactured into double wall corrugated pipe Greater Than or Equal to 15 inch diameter. Materials only.	Pound	$2.37	5510	$13,058.70
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 620 - Underground Outlet

Scenario: #145 - Greater than 30 inch

Scenario Description:

Install 500 feet of 36' approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. Trench excavation is 84' deep x 64' wide. Costs include 36' HDPE pipe, Precast concrete drop inlet with steel grate, trench excavation, bedding material, trench backfill, rodent guard and laid up stone headwall at outlet. This practice is often installed in conjunction with terraces, diversions, sediment control basins, waterways or simlar practices.

Before Situation:

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds 'T' from farm fields and other locations. Also, roof runoff or surface runoff that becomes contminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.

After Situation:

Field system meets 'T' or 'clean' storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

Feature Measure: Length of Conduit

Scenario Unit: Feet

Scenario Typical Size: 500.00

Scenario Total Cost: $34,399.12

Scenario Cost/Unit: $68.80

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, common earth, small equipment, 50 ft	1220	Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yards	$2.81	690	$1,938.90
Excavation, common earth, side cast, large equipment	1227	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$1.61	690	$1,110.90
Compaction, earthfill, vibratory plate	1260	Compaction of earthfill with a walk behind vibratory plate compactor in typical 6-8 inch thick lifts, 2 passes. Includes equipment and labor.	Cubic Yards	$2.80	2	$5.60
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	4	$194.40
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement.	Cubic Yards	$136.88	1	$136.88
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	135	$4,098.60
Catch Basin, concrete, 3 ft. x 3 ft. x 6 ft.	1258	Catch Basin, Precast Concrete, 3 feet square or round, cast grate, 6 feet deep. Includes materials, equipment and labor.	Each	$1,874.18	1	$1,874.18
Pipe, HDPE, corrugated double wall, GTE 15 in., soil tight, weight priced	1588	High Density Polyethylene (HDPE) compound manufactured into double wall corrugated pipe Greater Than or Equal to 15 inch diameter. Materials only.	Pound	$2.37	9920	$23,510.40
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 620 - Underground Outlet

Scenario: #146 - 30 inch or less

Scenario Description:

Install 500 feet of 30' approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. Trench excavation is 78' deep x 56' wide. Costs include 30' HDPE pipe, Precast concrete drop inlet with steel grate, trench excavation, bedding material, trench backfill, rodent guard and laid up stone headwall at outlet. This practices is often installed in conjunction with terraces, diversions, sediment control basins, waterways or simlar practices.

Before Situation:

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds 'T' from farm fields and other locations. Also, roof runoff or surface runoff that becomes contminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.

After Situation:

Field system meets 'T' or 'clean' storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

Feature Measure: Length of Conduit

Scenario Unit: Feet

Scenario Typical Size: 500.00

Scenario Total Cost: $27,709.97

Scenario Cost/Unit: $55.42

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, common earth, small equipment, 50 ft	1220	Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yards	$2.81	565	$1,587.65
Excavation, common earth, side cast, large equipment	1227	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$1.61	565	$909.65
Compaction, earthfill, vibratory plate	1260	Compaction of earthfill with a walk behind vibratory plate compactor in typical 6-8 inch thick lifts, 2 passes. Includes equipment and labor.	Cubic Yards	$2.80	2	$5.60
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	4	$194.40
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement.	Cubic Yards	$136.88	1	$136.88
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	105	$3,187.80
Catch Basin, concrete, 3 ft. x 3 ft. x 6 ft.	1258	Catch Basin, Precast Concrete, 3 feet square or round, cast grate, 6 feet deep. Includes materials, equipment and labor.	Each	$1,874.18	1	$1,874.18
Pipe, HDPE, corrugated double wall, GTE 15 in., soil tight, weight priced	1588	High Density Polyethylene (HDPE) compound manufactured into double wall corrugated pipe Greater Than or Equal to 15 inch diameter. Materials only.	Pound	$2.37	7715	$18,284.55
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 627 - Wastewater Treatment ??? Milk House

Scenario: #8 - Milkhouse Wastewater Filter Mound

Scenario Description:

This practice scenario is an above ground treatment system for <1500 gallons per day for milkhouse wastewater. This practice addresses water quality degradation of surface and ground water by reducing the nutrient content, organic strength, and/or pathogen levels of milking center wastewater. Air quality is improved by reducing odors and gaseous emissions. Milkhouse wastewater is pretreated then pumped through a pressurized distribution system to uniformly distribute the wastewater to the organic filter mound constructed out of shredded bark. Associated Practices: Diversion (362), Pumping plant (533).

Before Situation:

The dairy farm handles its manure as a solid. The milkhouse wastewater is flowing into a old septic system that is failing or piped to a field tile that discharges into surface waters. The failing septic system or surface water discharge is polluting ground water and surface waters. Air quality is degraded from pooling of untreated milkhouse wastewater.

After Situation:

Milkhouse wastewater passes through a series of settling tanks as a pretreatment function; typically 2 tanks to filter and capture solids and milk fats followed by a pump dose septic tank. At the outlet of the second tank is a commercial size effluent filter with another effluent filter located prior to the pump chamber (pump chamber to be contracted separately using pumping plant (533)). After the pumping chamber (in the pump dose tank) a screen filter is installed on the pressurized pipeline. This wastewater is then pumped to a pressure controlled sequencing valve and manifold connected to 4 distribution lines where the wastewater is uniformly sprayed into each bark filter mound section, this scenario has 4 treatment zones. The bark filter mounds are trapezoidal shape with a 20 ft base, 5 ft depth and 8.0 ft top width, 50ft long per zone. The wastewater distribution pipe is placed in the mound on top of 3 feet of compacted shredded bark. A spray chamber is placed over the distribution pipe to promote splash distribution on the surface of the shredded bark and enhance aeration for treatment. The spray chambers are then covered with 12 inches of shredded bark to minimize odors and provide insulation during cold weather operation. This scenario is a 200 ft long bark filter mound that has four 50 ft long sections (Foot Print base: 20ft x 200ft = 4000 sqft). The scenario provides treatment for 640 gpd of milking center wastewater using a loading rate of 0.16 gal/d/sf results in a 4000 sqft treatment filter mound area.

Feature Measure: Organic Filter Mound Foot Print Ar

Scenario Unit: Square Feet

Scenario Typical Size: 4,000.00

Scenario Total Cost: $79,544.23

Scenario Cost/Unit: $19.89

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	49	$306.25
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	28	$3,654.28
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$56.88	14	$796.32
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$75.12	2	$150.24
Aggregate, Wood Chips	1098	Includes materials, equipment and labor to transport and place.	Cubic Yards	$50.92	689	$35,083.88
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	40	$1,754.80
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	40	$1,148.40
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	14	$425.04
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	30	$1,203.90
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	12	$583.20
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	8	$242.88
Tank, Concrete, 2500 gallon	1055	Concrete tank for water storage, with riser and lid. Includes materials and delivery.	Each	$3,334.76	2	$6,669.52

Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.29	999.4	$2,288.63
Aggregate, gravel, washed, pea gravel	1331	Washed and graded pea gravel river stone. Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$32.50	41	$1,332.50
Pipe, HDPE, smooth wall, weight priced	1379	High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only.	Pound	$3.59	155	$556.45
Pipe, HDPE, corrugated double wall, GTE 15 in., soil tight, weight priced	1588	High Density Polyethylene (HDPE) compound manufactured into double wall corrugated pipe Greater Than or Equal to 15 inch diameter. Materials only.	Pound	$2.37	198.4	$470.21
Prefabricated concrete septic tank, 1500 gal	1738	Precast concrete septic tank, 1,500 gal. Materials only.	Each	$1,356.97	1	$1,356.97
Riser, Septic Tank	2067	24 inch HDPE riser with cover. Materials only.	Each	$290.07	3	$870.21
Ball Valve, 1.5 in. Coupling, PVC	2560	1.5 in. ball valve, PVC body, Includes Materials and Shipping only;	Each	$8.31	16	$132.96
Ball Valve, 2.0 in. Coupling, PVC	2561	2.0 in. ball valve, PVC body. Includes Materials and Shipping only;	Each	$9.98	6	$59.88
Lid, Fiberglass, 36 in.	2572	36 inch Nominal Diameter Fiberglass Lid with 2500-lb (1134-kg) wheel load capacity used typically for risers, pump basins, and access ports. Includes materials and shipping only.	Each	$781.56	5	$3,907.80
Filter, Effluent, four cell, 1/16 inch	2573	A multi-faceted (four cell) filter unit designed to filter solids down to 1/16-inch preventing solids from leaving the wastewater effluent pretreatment tank. Includes materials and shipping.	Each	$650.00	1	$650.00
Filter, effluent, screen	2590	Effluent filter on a pressurized system, filter is stainless steel, removable for cleaning. Filter sizes 1/16 - 3/32 inch provides 69.52 square inch of open filtration area. Includes materials and shipping only.	Each	$297.00	1	$297.00
Filter, effluent, slit	2591	PE effluent filter cartridge with automatic shut-off ball. Provides 525 linear feet filtration area with 1/16 inch filtration slots. Includes materials and shipping.	Each	$438.98	1	$438.98
Valve, sequencing, pressure	2598	Hydraulic and pressure controlled valve, no power source, wastewater sequencing valve for treatment distribution with 1.5' unions; Includes materials and shipping only.	Each	$281.30	1	$281.30
PE Irrigation Valve Box, 10 in.	2622	10 inch round PE irrigation valve box with lids; Includes materials and shipping only.	Each	$28.60	16	$457.60
Chamber, distribution, leaching	2626	High-density polyethylene (HDPE) chamber with an open bottom interlocking with an integral articulating joint used in onsite wastewater disposal application. Includes materials and shipping only.	Each	$74.21	143	$10,612.03
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	690	$690.00
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	4	$728.32
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	3	$2,293.89
Aggregate, Shipping, Cubic Yard-mile	2360	Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul).	Cubic Yard Mile	$0.42	240	$100.80

Practice: 627 - Wastewater Treatment ??? Milk House

Scenario: #9 - Wastewater Gravel Bed Treatment

Scenario Description:

This practice scenario includes a pre treatment system for milking parlor wastewater. The purpose of the practice is to address resource concerns related to water quality degradation due to (excess nutrient, salts and pathogens). Associated practices: Nutrient Management (590), Pumping Plant (533), Fence (382), Waste Storage Facility (313), Waste Transfer (634), Pond Sealing or Lining, Geomembrane or Geosynthetic Clay Liner (521), Irrigation Pipeline (430), Sprinkler System (442), Heavy Use Area Protection (561), Critical Area Planting (342), Sediment Basin (350), Drainage Water Management (554), Waste Separation (632), Vegetative Treatment Area (635)

Before Situation:

Milking operation handles its waste as a solid. The milking center wastewater is flowing into an old septic system that is failing or piped directly to a field tile that discharges to surface waters. The failing septic system or surface water discharge is polluting ground water and surface waters. Air quality is degraded from pooling of untreated milking center wastewater.

After Situation:

This scenario is based on treatment of 576 gallons/day of milkhouse wastewater (100 milking cow herd) using a loading rate of 0.75 gal/day/sf = 768 sf area is needed to treat the wastewater. 2 pre-treatment settling tanks and a pump dose septic tank are installed with filters. Wastewater is then pumped (use pumping plant-533 contracted separately; 4 pumps will be needed (3 for each treatment cell plus initial pump into the system - 1st or 2nd cell) depending on the system set up into a 768 sq. foot gravel treatment bed that has 3 treatment cells (16' x 16' x 4ft deep). The gravel treatment bed is constructed above ground and lined with a synthetic liner (contracted separately under CPS 521). PVC pipe with drilled holes evenly spaced is placed in the treatment bed; just below the gravel surface. Each gravel bed cell provides an in-series treatment to the wastewater with final discharge by pump or gravity to a soil treatment- leach field, VTA, irrigated, or waste storage facility. The gravel bed treats the wastewater effluent by reducing excess nutrients in the wastewater before the effluent is transported to the waste storage facility or discharged off site if permitted by regulation. Milkhouse is effectively treated and no longer discharging into surface water or seeping into ground water resources.

Feature Measure: Total Area of Treatment Bed- Outsi

Scenario Unit: Square Feet

Scenario Typical Size: 768.00

Scenario Total Cost: $40,988.59

Scenario Cost/Unit: $53.37

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	8	$50.00
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	8	$626.40
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	20	$2,610.20
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$75.12	5	$375.60
Demolition, concrete	1498	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yards	$11.57	7	$80.99
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	40	$1,754.80
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	10	$287.10
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	30	$1,203.90
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	15	$729.00
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	8	$242.88
Dimension Lumber, Treated	1044	Treated dimension lumber with nominal thickness equal or less than 2 inches. Includes lumber and fasteners	Board Feet	$1.79	576	$1,031.04
Tank, Concrete, 2500 gallon	1055	Concrete tank for water storage, with riser and lid. Includes materials and delivery.	Each	$3,334.76	2	$6,669.52
Switches and Controls, programmable controller	1193	Programmable logic controller (with or without wireless telecommunications) commonly used to control pumps and irrigation systems	Each	$623.08	3	$1,869.24

Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.29	718.8	$1,646.05
Aggregate, gravel, washed, pea gravel	1331	Washed and graded pea gravel river stone. Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$32.50	114	$3,705.00
Pipe, HDPE, smooth wall, weight priced	1379	High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only.	Pound	$3.59	205	$735.95
Pipe, HDPE, corrugated double wall, GTE 15 in., soil tight, weight priced	1588	High Density Polyethylene (HDPE) compound manufactured into double wall corrugated pipe Greater Than or Equal to 15 inch diameter. Materials only.	Pound	$2.37	297.6	$705.31
Lumber, planks, posts and timbers, treated	1609	Treated dimension lumber with nominal thickness greater than 2 inches. Includes lumber and fasteners. Does not include labor.	Board Feet	$3.53	320	$1,129.60
Prefabricated concrete septic tank, 1500 gal	1738	Precast concrete septic tank, 1,500 gal. Materials only.	Each	$1,356.97	1	$1,356.97
Plywood, 3/4 inch, untreated	1833	Untreated 4 x 8 ft. sheets of 3/4 inch exterior grade plywood. Includes materials only.	Each	$39.15	24	$939.60
Valve, distribution	2064	Sequencing valve, 4 or 6 way, for pressure dosing wastewater. Includes materials and shipping only.	Each	$157.08	3	$471.24
Riser, Septic Tank	2067	24 inch HDPE riser with cover. Materials only.	Each	$290.07	5	$1,450.35
Ball Valve, 1.5 in. Coupling, PVC	2560	1.5 in. ball valve, PVC body, Includes Materials and Shipping only;	Each	$8.31	12	$99.72
Ball Valve, 2.0 in. Coupling, PVC	2561	2.0 in. ball valve, PVC body. Includes Materials and Shipping only;	Each	$9.98	28	$279.44
Lid, Fiberglass, 36 in.	2572	36 inch Nominal Diameter Fiberglass Lid with 2500-lb (1134-kg) wheel load capacity used typically for risers, pump basins, and access ports. Includes materials and shipping only.	Each	$781.56	6	$4,689.36
Filter, Effluent, four cell, 1/16 inch	2573	A multi-faceted (four cell) filter unit designed to filter solids down to 1/16-inch preventing solids from leaving the wastewater effluent pretreatment tank. Includes materials and shipping.	Each	$650.00	1	$650.00
Filter, effluent, screen	2590	Effluent filter on a pressurized system, filter is stainless steel, removable for cleaning. Filter sizes 1/16 - 3/32 inch provides 69.52 square inch of open filtration area. Includes materials and shipping only.	Each	$297.00	1	$297.00
Filter, effluent, slit	2591	PE effluent filter cartridge with automatic shut-off ball. Provides 525 linear feet filtration area with 1/16 inch filtration slots. Includes materials and shipping.	Each	$438.98	1	$438.98
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	4	$728.32
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	3	$2,293.89
Aggregate, Shipping, Cubic Yard-mile	2360	Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul).	Cubic Yard Mile	$0.42	3660	$1,537.20

Practice: 627 - Wastewater Treatment ??? Milk House

Scenario: #10 - Soil Treatment System - Leach Field

Scenario Description:

This practice scenario consists of a subsurface soil treatment system using leaching trenches/chambers for final treatment of milkhouse wastewater after it has been treated in a pretreatment septic tank system with filters or an ATU followed by a recirculation media filter treatment system and this is the final treatment of the waste stream into the soil. This system would apply to < 750 gallons/day of milkhouse wastewater (150 milking cow herd). Pre-treatment system of the wastewater is required before the final soil treatment system. Leaching trenches/chambers require a minimum separation distance from the bottom of the soil treatment bed; two feet to seasonal high groundwater and four feet from bedrock. Associated practices: Constructed Wetland (656), Waste Transfer (634), Pumping Plant (533), Fence (382), Critical Area Planting (342), Underground Outlet (606) and Drainage Water Management (554), (629) Waste Treatment, and possibly another treatment system using (627) Waste Treatment- Milkhouse.

Before Situation:

Milkhouse wastewater currently outlets in an untreated manner causing nutrient movement to surface and groundwater. Potential soil erosion, nutrient loading and air quality concerns also exist

After Situation:

This scenario is based on treatment of 500 gallons/day of pretreated milkhouse wastewater to be applied on a loamy sand. Pretreatment occurs in a series of septic tanks with filters or an ATU followed by a recirculation filter media treatment system that reduces the wastewater BOD to approximately 200mg/l or lower. This scenario is using a BOD of 50 mg/l. Pre- treatment of the wastewater is required prior to using a soil treatment system as a final treatment into the environment. The soil loading rate used in this scenario is 0.75 gpd/ft2. The wastewater flows through a distribution box that apportions the wastewater to the subsurface soil treatment system consisting of leaching trenches/chambers with drainage stone surrounding the distribution pipe and 6' stone cover over the pipe, 337 gals/d is discharged into the soil treatment system and 163 gpd is recirculated back into the secondary treatment system. The soil system receives 337 gallons/day at a loading rate of 0.75 gpd/ft2 = 450 sq ft area.

Feature Measure: Area of Soil Treatment System

Scenario Unit: Square Feet

Scenario Typical Size: 450.00

Scenario Total Cost: $19,009.36

Scenario Cost/Unit: $42.24

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	74	$462.50
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	40	$5,220.40
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yards	$0.87	112	$97.44
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	64	$1,837.44
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	40	$1,605.20
Materials						
Geotextile, non-woven, light weight	1209	Non-woven less than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	$2.08	55	$114.40
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.29	317.4	$726.85
Aggregate, gravel, washed, pea gravel	1331	Washed and graded pea gravel river stone. Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$32.50	47	$1,527.50
Pipe, HDPE, corrugated double wall, GTE 15 in., soil tight, weight priced	1588	High Density Polyethylene (HDPE) compound manufactured into double wall corrugated pipe Greater Than or Equal to 15 inch diameter. Materials only.	Pound	$2.37	198.4	$470.21
Ball Valve, 2.0 in. Coupling, PVC	2561	2.0 in. ball valve, PVC body. Includes Materials and Shipping only;	Each	$9.98	4	$39.92
Lid, Fiberglass, 36 in.	2572	36 inch Nominal Diameter Fiberglass Lid with 2500-lb (1134-kg) wheel load capacity used typically for risers, pump basins, and access ports. Includes materials and shipping only.	Each	$781.56	1	$781.56
Valve, sequencing, pressure	2598	Hydraulic and pressure controlled valve, no power source, wastewater sequencing valve for treatment distribution with 1.5' unions; Includes materials and shipping only.	Each	$281.30	1	$281.30

PE Irrigation Valve Box, 10 in.	2622	10 inch round PE irrigation valve box with lids; Includes materials and shipping only.	Each	$28.60	3	$85.80
Chamber, distribution, leaching	2626	High-density polyethylene (HDPE) chamber with an open bottom interlocking with an integral articulating joint used in onsite wastewater disposal application. Includes materials and shipping only.	Each	$74.21	54	$4,007.34
Mobilization						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollars	$1.00	100	$100.00
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	4	$728.32
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 627 - Wastewater Treatment ??? Milk House

Scenario: #18 - Dosing System

Scenario Description:

This practice scenario includes a dosed treatment system for milking parlor wastewater that will outlet to a constructed wetland and/or vegetated treatment area and/or other acceptable treatment. The purpose of the practice is to address resource concerns related to water quality degradation due to (excess nutrient, salts and pathogens).Associated practices: Constructed Wetland (656), Vegetated Treatment Area (635), Waste Transfer (634), Nutrient Management (590), Pumping Plant (533), Fence (382), &Waste Storage Facility (313)

Before Situation:

Milkhouse waste water currently (TEST} outlets in an untreated manner which presents potential soil, water and air quality concerns.

After Situation:

This scenario assumes that the treatment system is designed for 500 gal/day of wastewater from the milking parlor. It assumes a two tank scenario. The grease trap acts as the primary settling basin. The wastewater overflows into the septic tank, which is then dosed to a treatment area (constructed wetland and/or vegetated treatment area and/or other acceptable treatment). This practice scenario reduces nutrient content, organic strength, or pathogen levels of agricultural waste; improve air quality by reducing odors and gaseous emissions (methane or ammonia).

Feature Measure: Design Flow rate

Scenario Unit: Gallons per Day

Scenario Typical Size: 500.00

Scenario Total Cost: $13,941.58

Scenario Cost/Unit: $27.88

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.39	1	$116.39
Equipment Installation						
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	101	$631.25
Trenching, Earth, 12 in. x 48 in.	53	Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling	Feet	$1.43	450	$643.50
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yards	$3.67	182	$667.94
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	24	$1,052.88
Materials						
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$23.32	7	$163.24
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.29	716	$1,639.64
Pipe, HDPE, smooth wall, weight priced	1379	High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only.	Pound	$3.59	190	$682.10
Prefabricated concrete septic tank, 1500 gal	1738	Precast concrete septic tank, 1,500 gal. Materials only.	Each	$1,356.97	2	$2,713.94
Dosing System, siphon	1763	Dosing system siphon with typical 3 inch diameter and 12 inch drawdown. Includes materials and shipping only.	Each	$277.48	1	$277.48
Riser, Septic Tank	2067	24 inch HDPE riser with cover. Materials only.	Each	$290.07	3	$870.21
Filter, Effluent, four cell, 1/16 inch	2573	A multi-faceted (four cell) filter unit designed to filter solids down to 1/16-inch preventing solids from leaving the wastewater effluent pretreatment tank. Includes materials and shipping.	Each	$650.00	1	$650.00
Filter, effluent, screen	2590	Effluent filter on a pressurized system, filter is stainless steel, removable for cleaning. Filter sizes 1/16 - 3/32 inch provides 69.52 square inch of open filtration area. Includes materials and shipping only.	Each	$297.00	1	$297.00
Filter, effluent, slit	2591	PE effluent filter cartridge with automatic shut-off ball. Provides 525 linear feet filtration area with 1/16 inch filtration slots. Includes materials and shipping.	Each	$438.98	1	$438.98
Mobilization						

Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	2	$1,846.38

Practice: 627 - Wastewater Treatment ??? Milk House

Scenario: #19 - Dosing System and Bark Bed

Scenario Description:
This practice scenario includes a dosed treatment system with bark bed for milking parlor wastewater. The purpose of the practice is to address resource concerns related to water quality degradation due to (excess nutrient, salts and pathogens).Associated practices: Nutrient Management (590), Pumping Plant (533), Fence (382), & Waste Storage Facility (313)

Before Situation:
Milkhouse waste water currently outlets in an untreated manner which presents potential soil, water and air quality concerns.

After Situation:
This scenario assumes that the treatment system is designed for 500 gal/day of wastewater from the milking parlor. It assumes a two tank scenario. The grease trap acts as the primary settling basin. The wastewater overflows into the septic tank, which is then dosed to the treatment bed (bark bed or leaching gallery). It is assumed that the treatment bed is dosed at 0.16 gal/square ft (3125 sq ft). To maintain bark bed performance, additional bark may need to be added every 3 to 5 years as an O&M task. This practice scenario reduces nutrient content, organic strength, or pathogen levels of agricultural waste; improve air quality by reducing odors and gaseous emissions (methane or ammonia).

Feature Measure: Design Flow

Scenario Unit: Gallons per Day

Scenario Typical Size: 500.00

Scenario Total Cost: $37,270.06

Scenario Cost/Unit: $74.54

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.39	1	$116.39
Equipment Installation						
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	101	$631.25
Trenching, Earth, 12 in. x 48 in.	53	Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling	Feet	$1.43	450	$643.50
Aggregate, Wood Chips	1098	Includes materials, equipment and labor to transport and place.	Cubic Yards	$50.92	348	$17,720.16
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yards	$0.87	116	$100.92
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yards	$3.67	472	$1,732.24
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	34	$1,491.58
Materials						
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$23.32	123	$2,868.36
Geotextile, non-woven, light weight	1209	Non-woven less than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	$2.08	382	$794.56
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.29	936.4	$2,144.36
Pipe, HDPE, smooth wall, weight priced	1379	High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only.	Pound	$3.59	190	$682.10
Prefabricated concrete septic tank, 1500 gal	1738	Precast concrete septic tank, 1,500 gal. Materials only.	Each	$1,356.97	2	$2,713.94
Dosing System, siphon	1763	Dosing system siphon with typical 3 inch diameter and 12 inch drawdown. Includes materials and shipping only.	Each	$277.48	1	$277.48
Riser, Septic Tank	2067	24 inch HDPE riser with cover. Materials only.	Each	$290.07	3	$870.21
Filter, Effluent, four cell, 1/16 inch	2573	A multi-faceted (four cell) filter unit designed to filter solids down to 1/16-inch preventing solids from leaving the wastewater effluent pretreatment tank. Includes materials and shipping.	Each	$650.00	1	$650.00

Filter, effluent, screen	2590	Effluent filter on a pressurized system, filter is stainless steel, removable for cleaning. Filter sizes 1/16 - 3/32 inch provides 69.52 square inch of open filtration area. Includes materials and shipping only.	Each	$297.00	1	$297.00
Filter, effluent, slit	2591	PE effluent filter cartridge with automatic shut-off ball. Provides 525 linear feet filtration area with 1/16 inch filtration slots. Includes materials and shipping.	Each	$438.98	1	$438.98
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	2	$1,846.38

Practice: 629 - Waste Treatment

Scenario: #7 - Feed leachate systems - earth/clay/flexible membrane liner

Scenario Description:

Earth/clay/flexible membrane liners are needed in connection with Feed leachate systems for a complete system. They are used to improve ground and surface water quality by reducing nutrient content, organic strength, or pathogen levels of agricultural waste.

Associated practices: Constructed Wetland (656), Vegetated Treatment Area (635), Waste Transfer (634), Nutrient Management (590), Pumping Plant (533), Fence (382), Waste Storage Facility (313), Pond Sealing or Lining, Geomembrane or Geosynthetic Clay Liner (521), Pond Sealing or Lining - Compacted Soil (520), Irrigation Pipeline (430), Sprinkler System (442), Heavy Use Area Protection (561), Critical Area Planting (342), Sediment Basin (350), Underground Outlet (606) and Drainage Water Management (554)

Before Situation:

Agriculture waste water or nutrient rich runoff currently outlets in an untreated manner which presents potential soil, water and air quality concerns.

After Situation:

This scenario applies to a 100' x 50' feed storage pad area. The scenario captures the leachate from the edges and under the feed pad and the wastewater is then transferred to a collection basin where it is then sent to storage or treatment. This practice scenario protects the soil and ground water from contamination and is used to facilitate desirable waste handling, storage, and/or land application alternatives, or manage leachate and contaminated runoff emanating from livestock feed storage areas. The actual hard surface treatment must be contracted under the associated practice for that surface. This scenario addresses the drainage treatment.

Feature Measure: Square feet of liner

Scenario Unit: Square Feet

Scenario Typical Size: 5,000.00

Scenario Total Cost: $6,455.05

Scenario Cost/Unit: $1.29

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	185	$1,156.25
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yards	$3.67	370	$1,357.90
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	8	$242.88
Materials						
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$23.32	93	$2,168.76
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 629 - Waste Treatment

Scenario: #8 - Feed leachate systems - concrete liner

Scenario Description:

Concrete liners are needed in connection with Feed leachate systems for a complete system. They are used to improve ground and surface water quality by reducing nutrient content, organic strength, or pathogen levels of agricultural waste. This practice is under Waste Treatment since a separate standard was not allowed and this standard is where the liner was placed. Associated practices: Constructed Wetland (656), Vegetated Treatment Area (635), Waste Transfer (634), Nutrient Management (590), Pumping Plant (533), Fence (382), & Waste Storage Facility (313), Pond Sealing or lining Flexible Membrane (521A), Pond Sealing or Lining, Bentonite Treatment (521C), Pond Sealing or Lining, Compacted Clay Treatment (521D), Irrigation Pipeline (430), Sprinker System (442), Irrigation System Surface and Subsurface (443), Heavy Use Area Protection (561), Critical Area Planting (342), Sediment Basin (350), Underground Outlet (606), Drainage Water Management (554), Waste Separation (632)

Before Situation:

Agriculture waste water or nutrient rich runoff currently outlets in an untreated manner which presents potential soil, water and air quality concerns.

After Situation:

This scenario applies to a 100' x 50' feed storage pad area. The scenario uses the concrete liner as the drainage layer. No additional actual hard surface treatment must be contracted as an associated practice for that surface. Concrete is both the liner and surface. The wastewater is then transferred to a collection basin where it is then sent to storage or treatment. This practice scenario protects the soil and ground water from contamination and is used to facilitate desirable waste handling, storage, and/or land application alternatives, or manage leachate and contaminated runoff emanating from livestock feed storage areas. This scenario address the drainage treatment.

Feature Measure: Square feet of liner

Scenario Unit: Square Feet

Scenario Typical Size: 5,000.00

Scenario Total Cost: $45,843.67

Scenario Cost/Unit: $9.17

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	77.2	$38,696.50
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	4	$313.20
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	80	$2,296.80
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	2	$60.72
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	4	$160.52
Materials						
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$23.32	123	$2,868.36
Waterstop, PVC, ribbed, 3/16 in x 6 in	1614	Waterstop, PVC, ribbed, 3/16 inch thick by 6 inches wide. Includes materials, equipment and labor.	Feet	$7.58	50	$379.00
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 629 - Waste Treatment

Scenario: #44 - Aerobic Circulator

Scenario Description:
Aerobic circulators are added to an existing lagoon or liquid storage pond with adequate minimum treatment volume (at least 270 days storage) and depth (at least 4.5 feet) to circulate lagoon water in order to allow for oxygen interchange at the surface of the lagoon, creating aerobic conditions in the lagoon and reducing emissions of odors and other volatile gases.Associated practices: Waste Treatment Lagoon (359)

Before Situation:
The existing uncovered anaerobic lagoon or liquid storage pond results in emissions of odors, ammonia, methane, and other volatile gases.

After Situation:
One aerobic circulator is added to the existing lagoon or storage pond for each 100 animal units of manure input to the lagoon or storage pond, resulting in a conversion of the anaerobic liquid storage to an aerobic liquid storage and reducing emissions of odors and other volatile gases. The circulators are spaced at least 25 feet apart.

Feature Measure: Number of Animal Units Treated

Scenario Unit: Animal Unit

Scenario Typical Size: 500.00

Scenario Total Cost: $65,066.58

Scenario Cost/Unit: $130.13

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	4	$194.40
Materials						
Aerator or Circulator, Pond, Large	1709	Aerator or Circulator for pond or tank, 10 or more HP and/or 10 or more acres of surface area. Materials only	Each	$12,928.50	5	$64,642.50

Practice: 629 - Waste Treatment

Scenario: #45 - Waste Gasification, less than or equal to 700lbs./hour

Scenario Description:

'This scenario consists of installing a manufactured continuous feed waste gasification system designed to handle up to 700 pounds/hour of animal or agricultural waste. A gasifier can be part of a waste management system and be used to generate energy and/or heat. This plant will typically process the waste generated annually from an operation with less than 150,000 birds. The purpose of the practice is to address resource concerns related to water quality degradation due to excessive nutrients, organics, and pathogens being transported into surface and ground water resources. Air quality impacts will also be addressed, however, in non-attainment areas, higher levels of processing may be required. The roofed portion will be addressed under Roofs and Covers (367) and waste storage under Waste Storage Facility (313).Potential Associated Practices: Access Road (560), Animal Mortality Facility (316), Critical Area Planting (342), Fence (382), Heavy Use Area Protection (561), Nutrient Management (590), Roofs and Covers (367), Waste Storage Facility (313)'

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accummulating at the source, or other location, or are being transported, but not properly utilized or disposed. This situation poses an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and ground waters, in addition to excessive amounts of nutrients being applied as fertilizer.

After Situation:

'Gasification of animal wastes is being done in a manner that prevents non-point source pollution of excessive nutrients, organics, and pathogens from being transported into surface and ground water resources. Proper operation of the gasification facility results in little to no odor, gasification of the waste product, reduction in waste volume (ash or bio-char), and protection from animals functioning as vectors to minimize pathogen survival or spreading effects.The typical facility is installed to handle up to 300 pounds/hour of waste material on average for a small to medium sized poultry operation (operating an average of 18 hours/day). Included is a concrete slab for the gasifier and fuel tank, excavation and gravel sub-base. Ash materials are to be stored in suitable containers until land disposal as per the nutrient management plan or land-filled.'

Feature Measure: Pounds/hr Manure/Waste Processe

Scenario Unit: Pounds per Day

Scenario Typical Size: 5,400.00

Scenario Total Cost: $311,289.64

Scenario Cost/Unit: $57.65

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	22	$11,027.50
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	44	$110.88
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	2	$261.02
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	4	$114.84
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	2	$60.72
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	22	$667.92
Fuel Tank, Anchored	1033	Fuel tank for operating incinerators and/or gasifiers. Materials only.	Gallons	$5.50	285	$1,567.50
Manure Gasifier, (200lb/hour)	1748	Gasifier unit with the capacity to process up to 200 pounds per hour. Unit includes gasifier system, feed bin(s), and processing unit. Includes equipment and shipping only.	Each	$295,950.00	1	$295,950.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 632 - Waste Separation Facility

Scenario: #1 - One Mechanical Separator

Scenario Description:

A small mechanical separation facility to partition solids, liquids, and/or associated nutrients from animal waste streams. The partitioning of the previously mentioned components facilitates the protection of air and water quality, protects animal health, and improves the management of an animal waste management system. Mechanical separators may include, but are not limited to: static inclined screens , vibratory screens, rotating screens, centrifuges, screw or roller presses, or other systems. Associated practices include Nutrient Management (590), Composting Facility (317), Anaerobic Digester (366), Waste Storage Facility (313), Waste Recycling (633), Waste Transfer (634), Amendments for the Treatment of Agricultural Waste (591), Pumping Plant (533), Vegetated Treatment Area (635), Pond Lining or Sealing (521A-D), and Waste Treatment (629), Heavy Use Area Protection (561), Roofs and Covers (367), Roof Runoff Structure (558), Underground Outlet (620).

Before Situation:

Applicable to situations where partitioning solids, liquids, and nutrients will facilitate the management of an animal waste management system, improve air quality (reduce odors), and address water quality concerns.

After Situation:

One mechanical separator (a screw press) installed at a livestock facility before storage or treatment or after treatment, for example, after an anaerobic digester. Part of an animal waste management system.

Feature Measure: Item

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $107,598.54

Scenario Cost/Unit: $107,598.54

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	12	$6,015.00
Excavation, common earth, large equipment, 50 ft	1222	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yards	$1.56	30	$46.80
Compaction, earthfill, vibratory plate	1260	Compaction of earthfill with a walk behind vibratory plate compactor in typical 6-8 inch thick lifts, 2 passes. Includes equipment and labor.	Cubic Yards	$2.80	9.3	$26.04
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	16	$701.92
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	20	$574.20
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	10	$288.60
Screw or Roller Press - Large	1951	Screw or Roller Press with a capacity of => 100 GPM. Includes materials and equipment.	Each	$94,413.33	1	$94,413.33
Safety Guard, pipe fence and tractor guard	1953	Pipe fence and tractor guard 4 ft. tall with working loads expected from equipment and livestock. Materials and shipping only.	Feet	$371.67	6	$2,230.02
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	3	$546.24
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 632 - Waste Separation Facility

Scenario: #4 - Concrete Basin, Multiple Cells, Gravity

Scenario Description:

A concrete basin containing multiple cells with concrete walls and floor. Basin cells use gravity and time to separate a portion of the solids from a liquid waste stream from a drylot dairy, animal production or confinement facility. Often used where manure is cleaned by flushing. Use of multiple separation cells allows for the continuous operation and management of the waste stream to be altered between cells thereby providing time for the solids portion to drain to be handled as a solid, according to the nutrient management plan. Removes a portion of the solids to facilitate waste handling and to address water quality concerns. Associated practices include Nutrient Management (590), Composting Facility (317), Anaerobic Digester (366), Waste Storage Facility (313), Waste Recycling (633), Waste Transfer (634), Pumping Plant (533), Vegetated Treatment Area (635), Pond Lining or Sealing (520-521-522), and Waste Treatment (629), Heavy Use Area Protection (561), Underground Outlet (620).

Before Situation:

Applicable to situations and locations where partitioning solids, liquids, and nutrients will facilitate the management of an animal waste management system, improve air quality (reduce odors), and address water quality concerns.

After Situation:

One concrete gravity settling basin containing multiple cells. The multi cell basin structure is 70 feet wide by 80 ft long and 6 ft deep with an additional 10:1 entrance ramp. There are three cells to the basin with a clean out ramp the width of the structure on just one end. The center cell, used to drain the liquid portion, has 6 ft reinforced concrete 'T' walls with weeping wall structures. The center cell design volume is considered no more than half full to maintain drainage of the facility. The two outside cells collecting the separated solids (25 ft x 80 ft x 6 ft plus ramp storage) have outside walls that are designed to store the solid settled portion of the waste. The waste stream enters the basin at either of the outside cells via a waste transfer component, the liquid portion of the waste flows into the center cell where it is then pumped to a waste storage facility. The pump and long-term liquid and solid waste storage facilities are contracted separately. Basin removes a portion of the solids that otherwise make handling the waste stream solids content difficult to manage over time. Part of an animal waste and nutrient management system.

Feature Measure: Cubic Foot of Design Storage

Scenario Unit: Cubic Feet

Scenario Typical Size: 28,787.00

Scenario Total Cost: $185,912.52

Scenario Cost/Unit: $6.46

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	130	$65,162.50
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	181	$102,641.48
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	1740	$4,384.80
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	194	$777.94
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	24	$689.04
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	193	$5,859.48
Weeping Wall	1765	Weeping wall or picket screen structure for solid settling basin. Materials only.	Feet	$38.76	40	$1,550.40
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	3	$546.24
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	2	$607.88
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	3	$2,769.57

Practice: 632 - Waste Separation Facility

Scenario: #5 - Concrete Sand Settling Lane

Scenario Description:

A concrete structure, a concrete lane with curbs, used to capture and separate a portion of the solids, mainly sand, from a liquid stream from a confinement facility. Removes as portion of the solids to facilitate waste handling and to address water quality concerns. Associated practices include Nutrient Management (590), Composting Facility (317), Anaerobic Digester (366), Waste Storage Facility (313), Waste Recycling (633), Waste Transfer (634), Pumping Plant (533), Vegetated Treatment Area (635),Pond Lining or Sealing (520-521-522), and Waste Treatment (629), Heavy Use Area Protection (561), Underground Outlet (620).

Before Situation:

Applicable to situations where partitioning solids, liquids, and nutrients will facilitate the management of an animal waste management system, improve air quality (reduce odors), and address water quality concerns.

After Situation:

One concrete settling lane structure (16 ft wide by 200 ft long by 0.5 ft thick), very shallow slope with 2ft reinforced concrete walls on one side, 4 ft wall at inlet with spash blocks. Includes concrete apron for sand removal the length of the sand lane and 12 ft wide to account for the slope into the sand lane. This practice is constructed around or at a livestock feeding operation. Removes a portion of the solids (sand) that otherwise would leave with the runoff from an animal feeding operation. Part of an animal waste management system.

Feature Measure: Square Foot of Settling Lane Footpr

Scenario Unit: Square Feet

Scenario Typical Size: 3,200.00

Scenario Total Cost: $74,844.90

Scenario Cost/Unit: $23.39

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	88	$44,110.00
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	36.3	$20,585.00
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	535	$1,348.20
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	106	$425.06
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	106	$3,218.16
Concrete, splash blocks-, 4 in x 8 in x 16 in	1710	Precast concrete splash blocks 4 inch x 8 inch x 16 inch. Includes materials only.	Each	$12.36	7	$86.52
Safety Guard, pipe fence and tractor guard	1953	Pipe fence and tractor guard 4 ft. tall with working loads expected from equipment and livestock. Materials and shipping only.	Feet	$371.67	6	$2,230.02
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	3	$546.24
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	2	$607.88
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 632 - Waste Separation Facility

Scenario: #6 - Earthen w/Picket Fence Box

Scenario Description:

An excavated basin used to capture and separate a portion of the solids from a liquid stream from a feedlot or confinement facility to facilitate waste handling and to address water quality concerns. The excavated basin is created by excavation and construction of berm. A wooden picket fence box around an outlet is used to assist in separation of solids.Associated practices include Nutrient Management (590), Composting Facility (317), Waste Storage Facility (313), Waste Recycling (633), Waste Transfer (634), Pumping Plant (533), Vegetated Treatment Area (635), Waste Treatment (629), Pond Lining or Sealing (520-521-522), Heavy Use Area Protection (561), Underground Outlet (620), Critical Area Planting (342), Mulching (484), Structure for Water Control (587).

Before Situation:

Applicable to situations where partitioning solids, liquids, and nutrients will facilitate the management of an animal waste management system, improve air quality (reduce odors), and address water quality concerns.

After Situation:

The typical excavated basin is constructed by excavating 3' deep basin with 30' x 40' bottom dimensions and 2:1 side slopes. A 2' high embankment is constructed around the basin with 4' top width and 2:1 side slopes.

Feature Measure: Total Volume

Scenario Unit: Cubic Feet

Scenario Typical Size: 11,154.00

Scenario Total Cost: $4,047.35

Scenario Cost/Unit: $0.36

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	2	$1,002.50
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	205	$516.60
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	150	$601.50
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	20	$574.20
Materials						
Post, Wood, CCA treated, 6 in. x 8 ft.	12	Wood Post, End 6 inch dia. X 8 ft., CCA Treated. Includes materials and shipping only.	Each	$25.26	4	$101.04
Dimension Lumber, Treated	1044	Treated dimension lumber with nominal thickness equal or less than 2 inches. Includes lumber and fasteners	Board Feet	$1.79	272	$486.88
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 632 - Waste Separation Facility

Scenario: #7 - Mechanical system

Scenario Description:

A multi unit mechanical separation facility to partition solids, liquids, and/or associated nutrients from animal waste streams. The partitioning of the previously mentioned components facilitates the protection of air and water quality, protects animal health, and improves the management of an animal waste management system. Mechanical separators may include, but are not limited to: static inclined screens , vibratory screens, rotating screens, centrifuges, screw or roller presses, or other systems. Associated practices include Nutrient Management (590), Composting Facility (317), Anaerobic Digester (366), Waste Storage Facility (313), Waste Recycling (633), Waste Transfer (634), Amendments for the Treatment of Agricultural Waste (591), Pumping Plant (533), Vegetated Treatment Area (635),Pond Lining or Sealing (520-521-522), and Waste Treatment (629), Heavy Use Area Protection (561), Roofs and Covers (367), Roof Runoff Structure (558), Underground Outlet (620).

Before Situation:

Applicable to situations where partitioning solids, liquids, and nutrients will facilitate the management of an animal waste management system, improve air quality (reduce odors), and address water quality concerns.

After Situation:

A multi mechanical separation facility installed at livestock facility before storage or treatment or after treatment, for example, after an anaerobic digester. Part of an animal waste management system. This mechanical system has the ability to separate out sand followed by bedding organics. The waste water is transferred to storage, contract in addition; waste transfer (634), pumping plant (533), roofs and covers (367) as appropriate.

Feature Measure: Item

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $509,205.37

Scenario Cost/Unit: $509,205.37

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	74	$37,092.50
Excavation, common earth, large equipment, 50 ft	1222	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yards	$1.56	178	$277.68
Compaction, earthfill, vibratory plate	1260	Compaction of earthfill with a walk behind vibratory plate compactor in typical 6-8 inch thick lifts, 2 passes. Includes equipment and labor.	Cubic Yards	$2.80	60	$168.00
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	40	$1,754.80
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	40	$1,148.40
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	60	$1,731.60
Screw or Roller Press - Large	1951	Screw or Roller Press with a capacity of => 100 GPM. Includes materials and equipment.	Each	$94,413.33	2	$188,826.66
Safety Guard, pipe fence and tractor guard	1953	Pipe fence and tractor guard 4 ft. tall with working loads expected from equipment and livestock. Materials and shipping only.	Feet	$371.67	30	$11,150.10
Sand Separator, Large	2439	This unit receives sand laden manure, incorporated recycled liquids, and some clean water and removes the majority of the sand. Includes a vertical lift auger or pump to dump into the hopper. Can typically handle manure/bedding from 700 to 2,000 dairy cows.	Each	$263,753.00	1	$263,753.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	3	$546.24
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 632 - Waste Separation Facility

Scenario: #8 - Barnyard Basin Wall

Scenario Description:
A concrete or treated wood wall designed for the purpose of trapping agricultural waste from animal barnyards. Resource concerns addressed are excessive sediment and nutrients in surface water.

Before Situation:
An unconfined animal lot that has contaminated runoff delivering sediment and animal waste to confined channels leading to surface water or directly into surface waters leading to the deterioration of water quality of receiving waters.

After Situation:
The typical sediment basin is constructed by installing 100' of 2' high concrete wall or 4' treated wood wall around existing barnyard. The walls create the required detention storage. Associated practice(s): Other practices that may need to be implemented along with sediment basin to address all of the site specific resource concerns include: Vegetated Treatment Area (635) to treat sediment basin discharge, Heavy Use Area Protection (561) for surfacing the barnyard area for removing solids, Critical Area Planting (342) and Mulching (484) where necessary to prevent erosion following construction activities.

Feature Measure: Linear Feet of Basin Wall

Scenario Unit: Feet

Scenario Typical Size: 100.00

Scenario Total Cost: $9,001.95

Scenario Cost/Unit: $90.02

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	14.6	$8,279.37
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	8	$50.00
Materials						
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$23.32	8	$186.56
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 632 - Waste Separation Facility

Scenario: #11 - Earthen Settling Structure

Scenario Description:

An earthen structure, such as a basin or a terrace or dike like structure, used to capture and separate a portion of the solids from a liquid stream from a feedlot or confinement facility. A concrete pad should be installed on the bottom of the basin and around outlet structures to facilitate cleanout. Removes a portion of the solids to facilitate waste handling and to address water quality concerns. Associated practices include Nutrient Management (590), Composting Facility (317), Anaerobic Digester (366), Waste Storage Facility (313), Waste Recycling (633), Waste Transfer (634), Vegetated Treatment Area (635), Pond Lining or Sealing (521A-D), and Waste Treatment (629).

Before Situation:

Applicable to situations where partitioning solids, liquids, and nutrients will facilitate the management of an animal waste management system, improve air quality (reduce odors), and address water quality concerns.

After Situation:

One earthen settling basin structure (60 ft top width by 200 ft top length by 3 ft deep with 2.5:1 side slopes, with three screening outlet structures) constructed around or at a livestock feeding operation. Removes a portion of the solids that otherwise would leave with the runoff from an animal feeding operation. Part of an animal waste management system.

Feature Measure: Cubic Foot of Design Storage

Scenario Unit: Cubic Feet

Scenario Typical Size: 30,000.00

Scenario Total Cost: $18,801.86

Scenario Cost/Unit: $0.63

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	12	$6,804.96
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	1000	$2,520.00
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	1000	$4,010.00
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	8	$350.96
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	32	$918.72
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	14	$425.04
Weeping Wall	1765	Weeping wall or picket screen structure for solid settling basin. Materials only.	Feet	$38.76	24	$930.24
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	3	$546.24
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	2	$607.88
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 632 - Waste Separation Facility

Scenario: #16 - Concrete Basin

Scenario Description:

A concrete structure, such as a basin with concrete walls and floor, used to capture and separate a portion of the solids from a liquid stream from a feedlot or confinement facility. Removes a portion of the solids to facilitate waste handling and to address water quality concerns. Associated practices include Nutrient Management (590), Composting Facility (317), Anaerobic Digester (366), Waste Storage Facility (313), Waste Recycling (633), Waste Transfer (634), Pumping Plant (533), Vegetated Treatment Area (635), Pond Lining or Sealing (521A-D), and Waste Treatment (629).

Before Situation:

Applicable to situations where partitioning solids, liquids, and nutrients will facilitate the management of an animal waste management system, improve air quality (reduce odors), and address water quality concerns.

After Situation:

One concrete settling basin structure (20 ft wide by 30 ft long with 3 ft high walls and weeping wall/picket structure or outlet control) constructed around or at a livestock feeding operation. Removes a portion of the solids that otherwise would leave with the runoff from an animal feeding operation. Part of an animal waste management system.

Feature Measure: Cubic Foot of Design Storage

Scenario Unit: Cubic Feet

Scenario Typical Size: 1,800.00

Scenario Total Cost: $24,264.37

Scenario Cost/Unit: $13.48

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	19	$9,523.75
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	16	$9,073.28
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.11	50	$55.50
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	50	$126.00
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	50	$200.50
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	8	$350.96
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	24	$689.04
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	31	$941.16
Weeping Wall	1765	Weeping wall or picket screen structure for solid settling basin. Materials only.	Feet	$38.76	6	$232.56
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	3	$546.24
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	2	$607.88
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 632 - Waste Separation Facility

Scenario: #17 - Mechanical Separation Facility

Scenario Description:

A small mechanical separation facility to partition solids, liquids, and/or associated nutrients from animal waste streams. The partitioning of the previously mentioned components facilitates the protection of air and water quality, protects animal health, and improves the management of an animal waste management system. Mechanical separators may include, but are not limited to: static inclined screens, vibratory screens, rotating screens, centrifuges, screw or roller presses, or other systems. Associated practices include Nutrient Management (590), Composting Facility (317), Anaerobic Digester (366), Waste Storage Facility (313), Waste Recycling (633), Waste Transfer (634), Amendments for the Treatment of Agricultural Waste (591), Pumping Plant (533), Vegetated Treatment Area (635), Pond Lining or Sealing (521A-D), and Waste Treatment (629).

Before Situation:

Applicable to situations where partitioning solids, liquids, and nutrients will facilitate the management of an animal waste management system, improve air quality (reduce odors), and address water quality concerns.

After Situation:

One small mechanical separation facility (a vibratory or rotating screen) installed at livestock facility before storage or treatment or after treatment, for example, after an anaerobic digester. Part of an animal waste management system.

Feature Measure: Item

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $69,306.52

Scenario Cost/Unit: $69,306.52

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	10	$5,012.50
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	16	$701.92
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	32	$918.72
Materials						
Vibratory or Rotating Screen	1948	Vibratory or Rotating Screen, includes materials, shipping and equipment.	Each	$59,990.00	1	$59,990.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	3	$546.24
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	2	$607.88
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 634 - Waste Transfer

Scenario: #1 - Small transfer catch basin, less than 4,310 gallon

Scenario Description:

Installation for a manure and/or wastewater transfer system that includes materials and structures to transfer waste from a small (<4,310 gallons) catch basin (tank/basin/manhole/etc). This may include curbs, screens, precast manholes, sumps or catch basins. The wastewater will typically be transferred from the collection basin to a waste storage facility through a gravity or low pressure flow conduit.Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling; PS 635, Vegetated Treatment Area; PS 561, Heavy Use Area Protection; PS 629, Waste Treatment; PS 382, Fence; PS 606, Subsurface Drain; PS 620, Underground Outlet; PS 656, Constructed WetlandThis scenario addresses the potential for surface water and groundwater quality degradation from liquid wastewater running unchecked out of silage bunkers and off of animal feeding lots.

Before Situation:

Inadequate storage is available to collect wastewater from an operation that may contaminate surface or groundwater resources.

After Situation:

This practice scenario is suitable where the estimated volume of the catch basin (tank/basin/manhole/etc) is less than 4,310 gallons. The practice scenario typically includes materials and installation of flat and formed concrete for curbs and/or gutters to collect liquids, installation of an 8'x12'x6' reinforced concrete reception pit formed in place that includes safety fence w/gate or solid/grated cover along with 300' of 8' Sch 40 PVC pipe to storage. Pipe length for contract is increased by 10% to account for required fittings. The cost includes excavation, placement of subgrade as needed, forming, pouring and finishing of concrete structure and backfilling. Transfer pump if needed must be contracted under pumping plant, PS 533.

Feature Measure: Collection volume installed

Scenario Unit: Gallons

Scenario Typical Size: 4,309.00

Scenario Total Cost: $30,420.11

Scenario Cost/Unit: $7.06

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	6.1	$3,057.63
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	26.3	$14,914.20
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	23	$143.75
Trenching, Earth, 12 in. x 48 in.	53	Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling	Feet	$1.43	300	$429.00
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	12	$794.16
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	8	$626.40
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$75.12	4	$300.48
Demolition, concrete	1498	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yards	$11.57	3	$34.71
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	32	$918.72
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	12	$364.32
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	12	$583.20
Materials						
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$23.32	10	$233.20
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.29	1778.7	$4,073.22

Pipe, smooth steel, weight priced	1325	Smooth Steel pipe priced by the weight of the pipe materials. Materials only.	Pound	$3.47	242.4	$841.13
Safety chain tractor barrier	1725	3/8 in. transport chain barrier installed to prevent tractor equipment from entering wastewater collection basin or pit. Material cost only.	Feet	$3.60	40	$144.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	2	$364.16
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	3	$2,293.89

Practice: 634 - Waste Transfer

Scenario: #2 - Medium transfer catch basin, more than 4,309 gallons and less than 23,938 gallons

Scenario Description:

Installation for a manure and/or wastewater transfer system that includes materials and structures to transfer waste from a medium (> 4,309 and < 23,938 gallon) catch basin (tank/basin/manhole/etc).This may include curbs, screens, precast manholes, sumps or catch basins. The wastewater will typically be transferred from the collection basin to a waste storage facility through a gravity or low pressure flow conduit.Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling; PS 635, Vegetated Treatment Area PS 561, Heavy Use Area Protection; PS 629, Waste Treatment; PS 382, Fence; PS 606, Subsurface Drain; PS 620, Underground Outlet; PS 656, Constructed Wetland This scenario addresses the potential for surface water and groundwater quality degradation from liquid wastewater running unchecked out of silage bunkers and off of animal feeding lots.

Before Situation:

Inadequate storage is available to collect wastewater from an operation that may contaminate surface or groundwater resources.

After Situation:

This practice scenario is suitable where the estimated volume of the catch basin is from more than 4,309 gallons and less than 23,938 gallons. The practice scenario typically includes materials and installation of flat and formed concrete for curbs and/or gutters to collect liquids, a channel coming into a tank, the installation of an 16'x12'x8' reinforced concrete reception pit, formed in place that includes safety fence w/gate or solid/grated cover along with 300' of 12' Sch 40 PVC pipe to storage. Pipe length for contract is increased by 10% to account for required fittings. The cost includes excavation, placement of subgrade as needed, forming, pouring and finishing of concrete structure and backfilling. Transfer pump if needed must be contracted under pumping plant, PS 533.

Feature Measure: Collection volume installed

Scenario Unit: Gallons

Scenario Typical Size: 11,490.00

Scenario Total Cost: $57,660.64

Scenario Cost/Unit: $5.02

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	12.2	$6,115.25
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	46.2	$26,199.10
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	56	$350.00
Trenching, Earth, loam, 24 in. x 48 in.	54	Trenching, earth, loam, 24 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling	Feet	$3.06	300	$918.00
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	32	$2,117.76
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	16	$1,252.80
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$75.12	16	$1,201.92
Demolition, concrete	1498	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yards	$11.57	4	$46.28
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	34	$976.14
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	16	$485.76
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	48	$1,926.24
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	40	$1,944.00
Materials						
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$23.32	19	$443.08

Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.29	3336.3	$7,640.13
Pipe, smooth steel, weight priced	1325	Smooth Steel pipe priced by the weight of the pipe materials. Materials only.	Pound	$3.47	363.6	$1,261.69
Safety chain tractor barrier	1725	3/8 in. transport chain barrier installed to prevent tractor equipment from entering wastewater collection basin or pit. Material cost only.	Feet	$3.60	68	$244.80
Safety Guard, pipe fence and tractor guard	1953	Pipe fence and tractor guard 4 ft. tall with working loads expected from equipment and livestock. Materials and shipping only.	Feet	$371.67	3	$1,115.01
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	4	$3,058.52

Practice: 634 - Waste Transfer

Scenario: #3 - Large transfer catch basin, 23,938 gallons or more

Scenario Description:

Installation for a manure and/or wastewater transfer system that includes materials and structures to transfer waste from a large (>23,937 gallons) catch basin (tank/basin/manhole/etc). This may include curbs, screens, precast manholes, sumps or catch basins. The wastewater will typically be transferred from the collection basin to a waste storage facility through a gravity or low pressure flow conduit.Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling; PS 635, Vegetated Treatment Area PS 561, Heavy Use Area Protection; PS 629, Waste Treatment; PS 382, Fence; PS 606, Subsurface Drain; PS 620, Underground Outlet; PS 656, Constructed Wetland This scenario addresses the potential for surface water and groundwater quality degradation from liquid wastewater running unchecked out of silage bunkers and off of animal feeding lots.

Before Situation:

Inadequate storage is available to collect wastewater from an operation that may contaminate surface or groundwater resources. The transfer of waste water to a waste storage facility is required for the CNMP.

After Situation:

This practice scenario is suitable where the estimated design volume of the catch basin is > 23,937 gallons. The practice scenario typically includes materials and installation of flat and formed concrete for curbs and/or gutters to collect liquids, a channel coming into a tank, the installation of an 16'x20'x10' reinforced concrete reception pit formed in place that includes safety fence w/gate or solid/grated cover along with 300' of 12' Sch 40 PVC pipe to storage. Pipe length for contract is increased by 10% to account for required fittings. The cost includes excavation, placement of subgrade as needed, forming, pouring and finishing of concrete structure and backfilling as well as pipeline installation. Transfer pump if needed must be contracted under pumping plant, PS 533.

Feature Measure: Collection volume installed

Scenario Unit: Gallons

Scenario Typical Size: 23,938.00

Scenario Total Cost: $63,480.44

Scenario Cost/Unit: $2.65

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	9.3	$4,661.63
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	62.9	$35,669.33
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	56	$350.00
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	32	$2,117.76
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	16	$1,252.80
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$75.12	16	$1,201.92
Demolition, concrete	1498	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yards	$11.57	3	$34.71
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	30	$861.30
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	16	$485.76
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	48	$1,926.24
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	24	$1,166.40
Materials						
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$23.32	17	$396.44

Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.29	3336.3	$7,640.13
Pipe, smooth steel, weight priced	1325	Smooth Steel pipe priced by the weight of the pipe materials. Materials only.	Pound	$3.47	363.6	$1,261.69
Safety chain tractor barrier	1725	3/8 in. transport chain barrier installed to prevent tractor equipment from entering wastewater collection basin or pit. Material cost only.	Feet	$3.60	86	$309.60
Safety Guard, pipe fence and tractor guard	1953	Pipe fence and tractor guard 4 ft. tall with working loads expected from equipment and livestock. Materials and shipping only.	Feet	$371.67	4	$1,486.68
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	3	$2,293.89

Practice: 634 - Waste Transfer

Scenario: #4 - Wastewater Collection Basin

Scenario Description:
Installation for a wastewater collection and transfer system that includes materials and structures to collect liquids such as silage leachate, lot runoff and other contaminated effluent. This may include curbs, screens, precast manholes, sumps or catch basins. The wastewater will typically be transferred from the collection basin to a treatment area or a waste storage facility through a gravity or low pressure flow conduit.Associated practices may include: PS 313 Waste Storage Facility; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management; PS 633, Waste Recycling.

This scenario addresses the potential for surface water and groundwater quality degradation from liquid wastewater running unchecked out of silage bunkers and off of animal feeding lots.

Before Situation:
Inadequate storage is available to collect wastewater from an operation that may contaminate surface or groundwater resources. The liquids contain few solids or limited solids that can be easily screened out without blocking the collection intake.

After Situation:
This practice scenario is suitable where the estimated design volume for wastewater transfer of contaminated liquid that may flow from silage bunkers or animal lot areas after a precipitation event. The practice scenario typically includes materials and installation of flat and formed concrete for curbs and/or gutters to collect liquids. The transfer basin is one 881 gallon catch basin with a concrete slab inlet that is 15ft x 15ft; piped 200ft to storage. With the installation of a precast manhole with lid or catch basin with grate. The cost includes excavation, placement of bedding as needed, placement of structure and backfill with construction of concrete inlet collection area. Transfer pump if needed must be contracted under pumping plant, PS 533.

Feature Measure: Collection volume installed

Scenario Unit: Gallons

Scenario Typical Size: 881.00

Scenario Total Cost: $15,931.69

Scenario Cost/Unit: $18.08

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	3.5	$1,754.38
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	2.3	$1,304.28
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	81	$506.25
Trenching, Earth, loam, 24 in. x 48 in.	54	Trenching, earth, loam, 24 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling	Feet	$3.06	200	$612.00
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	8	$529.44
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	4	$313.20
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$75.12	4	$300.48
Demolition, concrete	1498	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yards	$11.57	2	$23.14
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	24	$689.04
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	4	$121.44
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	12	$481.56
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	24	$1,166.40
Materials						
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$23.32	6	$139.92

Pipe, smooth steel, weight priced	1325	Smooth Steel pipe priced by the weight of the pipe materials. Materials only.	Pound	$3.47	121.2	$420.56
Pipe, HDPE, corrugated double wall, LTE-12 in., soil tight, weight priced	1587	High Density Polyethylene (HDPE) compound manufactured into double wall corrugated pipe LTE-12 inch diameter. Materials only.	Pound	$3.10	308	$954.80
Catch Basin, concrete, 60 in dia.	1754	Precast 60-in diameter catch basin, 6 feet deep, with collar and grate cover. Materials only.	Each	$2,609.57	1	$2,609.57
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	5	$3,823.15

Practice: 634 - Waste Transfer

Scenario: #5 - Leachate collection system

Scenario Description:

Installation for a wastewater transfer system that includes materials and structures to transfer silage leachate and other contaminated effluent from a 100'x50' feed storage pad by means of channels, tanks, and pipes. The leachate is then transferred through a conduit to the waste storage structure and the other contaminated flow is transferred to a treatment area. This scenario includes a two cell reinforced concrete reception pit; from one cell, a 4' PVC Sch 40 conduit transfers the leachate and contaminated flow to a waste storage pond; from the second cell a 10' PVC Sch 40 conduit transfers the overflow to a treatment area. Reception Pit includes safety fence w/gate or solid/grated cover. The transfer conduit consists of the pipe plus the inlet structure connection and all other fittings, trench excavation and backfill, labor and equipment for installation. If pumping is required for the pipe flow velocity that needs to be contracted under PS 533, Pumping PlantAssociated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling; PS 635, Vegetated Treatment Area, PS 561, Heavy Use Area Protection; PS 629, Waste Treatment; PS 382, Fence; PS 606, Subsurface Drain; PS 620, Underground OutletThis scenario addresses the potential for surface water and groundwater quality degradation from liquid wastewater running unchecked out of silage bunkers.

Before Situation:

Inadequate storage is available to collect wastewater from an operation that may contaminate surface or groundwater resources. The transfer of waste water to a waste storage facility is required for the CNMP.

After Situation:

This practice scenario has a feed storage area of 100'x50'. The leachate and contaminated runoff from this area will be collected in a 2 cell 9'x16'x8' concrete reception tank. The leachate and first flush will be transferred under gravity or low pressure flow in a 4' PVC Sch. 40 pipeline to a waste storage pond. The overflow contaminated runoff is also collected in the second stage of the concrete reception tank and then transfered in an 10' dia Sch 40 PVC pipe to a treatment area. The practice scenario typically includes materials and installation of flat and formed concrete for curbs and gutters at the basin to collect liquid and the installation of the two stage reinforced concrete reception pit formed in place that includes safety fence w/gate or solid/grated cover. Both transfer pipelines are assumed to be 300 feet long, PVC gasketted Sch 40 pipe with an adapter for the concrete basin, couplers, air-vac vents, all other fittings placed as specified by the design, trench excavation, pipe bedding and backfill. Pipe length for contract is increased by 10% to account for required fittings. The cost includes excavation, placement of subgrade as needed, forming, pouring and finishing of concrete structure and backfilling as well as pipeline installation. Transfer pump if needed must be contracted under pumping plant, PS 533.

Feature Measure: Each Leachate Collection System

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $45,118.31

Scenario Cost/Unit: $45,118.31

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	8	$4,010.00
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	38.6	$21,889.29
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	100	$625.00
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	24	$1,588.32
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	8	$626.40
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$75.12	8	$600.96
Demolition, concrete	1498	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yards	$11.57	3	$34.71
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	38	$1,090.98
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	8	$242.88
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	32	$1,284.16
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	8	$388.80

Materials

Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$23.32	14	$326.48
Valve, Air Vacuum Release, Continuous	1106	Materials for <2 inch Automatic Air/Vacuum Relief Valve (3 - Way Air Vac)	Each	$201.15	1	$201.15
Valve, Air Vacuum Release, Continuous	1106	Materials for <2 inch Automatic Air/Vacuum Relief Valve (3 - Way Air Vac)	Each	$201.15	1	$201.15
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.29	3194.4	$7,315.18
Pipe, smooth steel, weight priced	1325	Smooth Steel pipe priced by the weight of the pipe materials. Materials only.	Pound	$3.47	545.5	$1,892.89
Safety chain tractor barrier	1725	3/8 in. transport chain barrier installed to prevent tractor equipment from entering wastewater collection basin or pit. Material cost only.	Feet	$3.60	90	$324.00

Mobilization

Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	3	$2,293.89

Practice: 634 - Waste Transfer

Scenario: #6 - Milkhouse transfer system

Scenario Description:
Installation for a wastewater transfer system that includes materials and structures to collect a design volume less than 5000 gallons of liquids from a milkhouse/parlor which is then transferred through a 8' low pressure conduit to the waste storage structure or frequent hauled. This scenario includes a reinforced concrete manure reception pit and a 8' PVC Sch 40 conduit to transfer the manure and wastewater to a waste storage pond. Reception Pit includes safety fence w/gate or solid/grated cover. The transfer conduit consists of the pipe plus the inlet structure connection and all other fittings, trench excavation and backfill, labor and equipment for installation. If pumping is required for the pipe flow velocity that needs to be contracted under PS 533, Pumping PlantAssociated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling, Vegetated Treatment Area, PS 561, Heavy Use Area Protection; PS 629, Waste Treatment; PS 382, Fence; PS 606, Subsurface Drain; PS 620, Underground Outlet; PS 656, Constructed WetlandThis scenario addresses the potential for surface water and groundwater quality degradation from liquid wastewater running unchecked out of silage bunkers and off of animal feeding lots.

Before Situation:
Inadequate storage is available to collect wastewater from an operation that may contaminate surface or groundwater resources. The transfer of waste water to a waste storage facility is required for the CNMP.

After Situation:
This practice scenario is for the estimated design volume for waste collection and transfer of 3000 gallons of liquid waste and can be transferred under gravity or low pressure flow in a 8' PVC pipeline to a waste storage pond. The practice scenario typically includes materials and installation a basin to collect liquid slurry waste and the installation of an 10'x8'x6' reinforced concrete reception pit formed in place that includes safety fence w/gate or solid/grated cover. The transfer pipeline is assumed to be 300 feet long, 8' PVC gasketted Sch 40 pipe with an adapter for the concrete basin, couplers, air-vac vents, all other fittings placed as specified by the design, trench excavation, pipe bedding and backfill. Pipe length for contract is increased by 10% to account for required fittings. The cost includes excavation, placement of subgrade as needed, forming, pouring and finishing of concrete structure and backfilling as well as pipeline installation. Transfer pump if needed must be contracted under pumping plant, PS 533.

Feature Measure: Collection volume installed

Scenario Unit: Gallons

Scenario Typical Size: 3,590.00

Scenario Total Cost: $21,518.48

Scenario Cost/Unit: $5.99

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	12	$6,804.96
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	50	$312.50
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	32	$2,117.76
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	8	$626.40
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$75.12	4	$300.48
Demolition, concrete	1498	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yards	$11.57	3	$34.71
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	32	$918.72
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	4	$121.44
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	40	$1,605.20
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	16	$777.60
Materials						
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$23.32	7	$163.24

Valve, Air Vacuum Release, Continuous	1106	Materials for <2 inch Automatic Air/Vacuum Relief Valve (3 - Way Air Vac)	Each	$201.15	1	$201.15
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.29	1778.7	$4,073.22
Pipe, smooth steel, weight priced	1325	Smooth Steel pipe priced by the weight of the pipe materials. Materials only.	Pound	$3.47	242.4	$841.13
Safety chain tractor barrier	1725	3/8 in. transport chain barrier installed to prevent tractor equipment from entering wastewater collection basin or pit. Material cost only.	Feet	$3.60	40	$144.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	3	$2,293.89

Practice: 634 - Waste Transfer

Scenario: #8 - Transfer channel/scrape alley with push-off wall at pond and safety gate

Scenario Description:

Installation of a waste transfer channel that consists of a slab with a curb and footing on each side of the slab for the entire length of the channel to transfer liquid waste to a collection basin and/or waste storage facility at the end of a push-off ramp. A safety gate is installed at the end of the push-off ramp. Water quality concerns will be addressed by preventing liquid waste from entering surface waters, and to facilitate timely land application of manure and wastewater at agronomic rates according to the CNMP. This scenario addresses the potential for surface water and groundwater quality degradation. Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling; PS 561, Heavy Use Area Protection; PS 382, Fence

Before Situation:

Current facility operations are allowing liquid waste to flow uncontrolled during periods of precipitation events or cleaning operations such that water resources can be contaminated.

After Situation:

Typical installation of a 10 foot wide 100' long concrete channel that consists of a 5' thick concrete slab with curbing on each side of the slab that is 1' high, 6' thick with footing for the entire length. The push-off ramp is a concrete cantilever structure that allows the waste to be moved into the storage facility. The purpose is to transfer liquids or manure slurry from one area to a collection basin or waste storage facility. Includes safety gate for human and animal exclusion.Alternative configurations can consist of the installation of a more narrow or wider channel that may or may not have curbs or a deeper shaped channel and may include a half pipe on the bottom.

Feature Measure: Length of Transfer channel

Scenario Unit: Linear Feet

Scenario Typical Size: 100.00

Scenario Total Cost: $26,267.08

Scenario Cost/Unit: $262.67

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	12.3	$6,165.38
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	18.4	$10,434.27
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	17	$106.25
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	16	$1,058.88
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	8	$626.40
Demolition, concrete	1498	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yards	$11.57	5	$57.85
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	16	$459.36
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	24	$963.12
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	50	$2,430.00
Materials						
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$23.32	21	$489.72
Pipe, smooth steel, weight priced	1325	Smooth Steel pipe priced by the weight of the pipe materials. Materials only.	Pound	$3.47	121.2	$420.56
Safety gate, span manure transfer channel or chute	1952	Safety gate to span manure transfer channel at push off wall or chute outlet. Minimum of 4 ft. tall with openings that will not pass a 6 inch or larger sphere. Includes materials only.	Feet	$22.48	14	$314.72
Mobilization						

Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	3	$2,293.89
Aggregate, Shipping, Cubic Yard-mile	2360	Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul).	Cubic Yard Mile	$0.42	630	$264.60

Practice: 634 - Waste Transfer

Scenario: #9 - Transfer channel to catch basin with transfer pipe to waste storage pond

Scenario Description:

Installation of a waste transfer channel that consists of a slab with curb and footing on each side of the slab for the entire length of the channel to transfer liquid waste to a 4300 gallon collection basin and/or waste storage facility. The wastewater is then transferred from the basin to the waste storage pond through a 12' diameter low pressure pipeline. Water quality concerns will be addressed by preventing liquid waste from entering surface waters, and to facilitate timely land application of manure and wastewater at agronomic rates according to the CNMP. This scenario addresses the potential for surface water and groundwater quality degradation. Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling; PS 635, Vegetated Treatment Area, PS 561, Heavy Use Area Protection; PS 629, Waste Treatment; PS 382, Fence; PS 606, Subsurface Drain; PS 620, Underground Outlet

Before Situation:

Current facility operations are allowing liquid waste to flow uncontrolled during periods of precipitation events or cleaning operations such that water resources can be contaminated. Waste transfer structures are needed to transfer wastes to a waste storage pond

After Situation:

Typical installation of a 10 foot wide 100' long concrete channel that consists of a 5' thick concrete slab with curbing on each side of the slab that is 2' high, 6' thick with footing for the entire length. The waste transfer scenario is to scrape liquids or manure slurry from the waste production area down the channel to a 8'x12'x6' collection basin. From the basin it is then transferred through a 12' pipe 300 feet to the waste storage pond. The scenario also includes a safety chain around the basin. The transfer pipe is a 12' diameter gasketted PVC SDR 41 low pressure pipeline. Pipe length for contract is increased by 10% to account for required fittings. The cost includes excavation, placement of subgrade as needed, forming, pouring and finishing of concrete structure and backfilling as well as pipeline installation costs for trench excavation, pipe bedding and backfill. Transfer pump if needed must be contracted under pumping plant, PS 533.Alternative configurations can consist of the installation of a more narrow or wider channel that may or may not have curbs or a deeper shaped channel and may include a half pipe on the bottom.

Feature Measure: Length of transfer channel

Scenario Unit: Linear Feet

Scenario Typical Size: 100.00

Scenario Total Cost: $54,143.15

Scenario Cost/Unit: $541.43

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	7	$3,508.75
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	46.5	$26,369.22
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	26	$104.26
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	54	$337.50
Trenching, Earth, loam, 24 in. x 48 in.	54	Trenching, earth, loam, 24 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling	Feet	$3.06	300	$918.00
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	24	$1,588.32
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	8	$626.40
Demolition, concrete	1498	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yards	$11.57	4	$46.28
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	156	$4,478.76
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	32	$1,284.16
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	40	$1,944.00
Materials						
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$23.32	26	$606.32

Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.29	3336.3	$7,640.13
Pipe, smooth steel, weight priced	1325	Smooth Steel pipe priced by the weight of the pipe materials. Materials only.	Pound	$3.47	484.9	$1,682.60
Safety chain tractor barrier	1725	3/8 in. transport chain barrier installed to prevent tractor equipment from entering wastewater collection basin or pit. Material cost only.	Feet	$3.60	48	$172.80
Safety gate, span manure transfer channel or chute	1952	Safety gate to span manure transfer channel at push off wall or chute outlet. Minimum of 4 ft. tall with openings that will not pass a 6 inch or larger sphere. Includes materials only.	Feet	$22.48	16	$359.68
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	3	$2,293.89

Practice: 634 - Waste Transfer

Scenario: #10 - Hopper inlet or pull plug with gravity pipeline to waste storage facility

Scenario Description:

Gravity flow conduit is typically a large diameter water tight HDPE sanitary sewer pipe used to transfer manure by gravity from one location to another. The gravity transfer system typically consists of an inlet structure, pull plug or hopper with an adaptor to a smooth interior large diameter HDPE pipe. The pipe conveys the slurry waste liquid or contaminated effluent between the waste collection point and a manure storage or waste treatment structure. Adequate head on the pipe flow or change in elevation must be available for the gravity system to function and should be evaluated by the design engineer. This practice includes the inlet structure, transfer pipe plus any and all other fittings, trench excavation and backfill, labor and equipment for installation.This conduit is part of a manure transfer system for a planned waste management or comprehensive nutrient management plan. This scenario addresses the transport of liquid waste to a waste storage or treatment facility to prevent a water quality resource concern of excessive nutrients/organics and harmful levels of pathogens in surface water and/or excessive nutrients/organics in ground water.

Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling; PS 561, Heavy Use Area Protection; PS 629, Waste Treatment; PS 382, Fence; PS 606, Subsurface Drain; PS 620, Underground Outlet

Before Situation:

An area of waste production is separated from the waste storage facility and current operations may cause water quality concerns as it is not efficient in transporting the waste to the storage. The site has a change in elevation between production area and treatment or storage structure that is adequate to provide sufficient head for a gravity flow conduit to transport the slurry waste liquid stream.

After Situation:

Install an 80 foot long gravity transfer system of a precast collection hopper with an adaptor to a water tight smooth interior 24'diameter HDPE sanitary sewer grade pipe that will flow to an outlet at the site of manure treatment or storage. This scenario includes the collection hopper, pipe, inlet, outlet, couplers and all other fittings, trench excavation, pipe bedding and backfill. The site should be evaluated by the designing engineer to make sure there is adequate elevation drop before contracting. The transfer conduit will provide collection and containment of the manure slurry, thereby protecting water quality resources.

Feature Measure: Each inlet and pipe system

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $14,274.13

Scenario Cost/Unit: $14,274.13

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	7	$3,508.75
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	54	$136.08
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	16	$100.00
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.45	6	$20.70
Hydraulic Excavator, .5 CY	930	Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included.	Hours	$101.18	11	$1,112.98
Demolition, concrete	1498	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yards	$11.57	4	$46.28
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	36	$1,033.56
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	11	$441.43
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	10	$486.00
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	7	$202.02
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$23.32	8	$186.56

Pipe, smooth steel, weight priced	1325	Smooth Steel pipe priced by the weight of the pipe materials. Materials only.	Pound	$3.47	242.4	$841.13
Pipe, HDPE, corrugated double wall, GTE 15 in., soil tight, weight priced	1588	High Density Polyethylene (HDPE) compound manufactured into double wall corrugated pipe Greater Than or Equal to 15 inch diameter. Materials only.	Pound	$2.37	969.8	$2,298.43
Catch Basin, concrete, 60 in dia.	1754	Precast 60-in diameter catch basin, 6 feet deep, with collar and grate cover. Materials only.	Each	$2,609.57	1	$2,609.57
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 634 - Waste Transfer

Scenario: #11 - Large Pipe Only, 18 inch diameter or larger

Scenario Description:

Gravity flow conduit is typically a large diameter water tight HDPE sanitary sewer pipe used to transfer manure by gravity from one location to another. The gravity transfer system typically consists of an existing inlet structure or hopper with attachment to a smooth interior large diameter pipe. The pipe conveys the slurry waste liquid between the waste collection point and a manure storage or waste treatment structure. Adequate head on the pipe flow or change in elevation must be available for the gravity system to function and should be evaluated by the design engineer. This practice includes the pipe attachment to an existing inlet structure and all other fittings, trench excavation and backfill, labor and a equipment for installation.This conduit is part of a manure transfer system for a planned waste management or comprehensive nutrient management plan. This scenario addresses the transport of liquid waste to a waste storage or treatment facility to prevent a water quality resource concern of excessive nutrients/organics and harmful levels of pathogens in surface water and/or excessive nutrients/organics in ground water. Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling; PS 561, Heavy Use Area Protection

Before Situation:

An area of waste production is separated from the waste storage facility and current operations may cause water quality concerns as it is not efficient in transporting the waste to the storage. The site has a change in elevation between production area and treatment or storage structure that is adequate to provide sufficient head for a gravity flow conduit to transport the slurry waste liquid stream.

After Situation:

Install a 150 foot long 24' diameter water tight HDPE pipe to transfer manure by gravity from one location to another. A gravity transfer system typically consists of a sealed inlet at an existing waste collection structure to a smooth interior 24' sewer grade pipe that will gravity flow to an outlet at a site of manure treatment or storage. This scenario includes the pipe, inlet, outlet, couplers and all other fittings, trench excavation, pipe bedding and backfill. The site should be evaluated by the designing engineer to make sure there is adequate elevation drop before contracting. If required an inlet structure may be contracted under another scenario.The transfer conduit will provide collection and containment of the manure slurry, thereby protecting water quality resources.

Feature Measure: Length of pipe installed

Scenario Unit: Feet

Scenario Typical Size: 150.00

Scenario Total Cost: $11,518.14

Scenario Cost/Unit: $76.79

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	7	$3,508.75
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	111	$279.72
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	67	$418.75
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.45	55	$189.75
Demolition, concrete	1498	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yards	$11.57	7	$80.99
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	24	$689.04
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	16	$777.60
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	11	$317.46
Pipe, HDPE, corrugated double wall, GTE 15 in., soil tight, weight priced	1588	High Density Polyethylene (HDPE) compound manufactured into double wall corrugated pipe Greater Than or Equal to 15 inch diameter. Materials only.	Pound	$2.37	1818.3	$4,309.37
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 634 - Waste Transfer

Scenario: #12 - Medium Pipe Only, between 6 and 18 inch diameter

Scenario Description:

Low pressure flow conduit is typically a PVC pipeline used to transfer wastewater or manure slurry by pumping from one production location to a storage or treatment location. Low pressure flow PVC transfer pipelines can be between 3' and 30' diameter and are designed for a pumping pressure of no more than 100 psi. The low pressure transfer system typically consists of an inlet structure or hopper connected to a smooth interior PVC pipe sized to deliver the design flow. This practice includes the pipe plus the inlet structure connection and all other fittings, trench excavation and backfill, labor and a equipment for installation.This conduit is part of a manure transfer system for a planned waste management or comprehensive nutrient management plan. This scenario addresses the transport of liquid waste to a waste storage or treatment to prevent a water quality resource concern of excessive nutrients/organics and harmful levels of pathogens in surface water and/or excessive nutrients/organics in ground water. Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling; PS 635, Vegetated Treatment Area; PS 561, Heavy Use Area Protection; PS 629, Waste Treatment; PS 382, Fence; PS 606, Subsurface Drain; PS 620, Underground Outlet; PS 656, Constructed Wetland

Before Situation:

An area of waste production is separated from the waste storage facility and current operations may cause water quality concerns. The site of waste collection or structure has the capacity to install a pumping plant but needs a pipeline to transfer the liquid manure slurry under low pressure from the collection site to the treatment or storage structure.

After Situation:

Install a 300 foot long 12 inch diameter low pressure wastewater pipeline to transfer wastewater or manure slurry from one location to another. The low pressure flow situation refers to pipeflow that has an unrestricted outlet and low pumping head pressure. A pumping plant will send the liquid through a pipe inlet at an existing waste collection basin into a 12 inch diameter pipeline to transfer the design volume to an outlet at the wastewater treatment or storage site. This scenario includes the pipe, inlet connection, outlet, couplers and all other fittings, trench excavation, pipe bedding and backfill. The site should be evaluated by the designing engineer before contracting. If required a pumping plant may be contracted under PS 533, Pumping Plant to support this system.The low pressure transfer conduit will provide collection, transfer and containment of the manure slurry, thereby protecting water quality resources.

Feature Measure: Length of pipe installed

Scenario Unit: Feet

Scenario Typical Size: 300.00

Scenario Total Cost: $14,660.51

Scenario Cost/Unit: $48.87

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formless, non reinforced	36	Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$220.05	1	$220.05
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	6	$3,007.50
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	97	$244.44
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	56	$350.00
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.45	41	$141.45
Demolition, concrete	1498	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yards	$11.57	7	$80.99
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	24	$689.04
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	16	$777.60
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	14	$404.04
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.29	3336.3	$7,640.13
Mobilization						

Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 634 - Waste Transfer

Scenario: #13 - Small Pipe Only, 6 inch diameter or smaller

Scenario Description:

Low pressure flow conduit is typically a PVC pipeline used to transfer wastewater or manure slurry by pumping from one production location to a storage or treatment location. Low pressure flow PVC transfer pipelines can be between 3' and 30' diameter and are designed for a pumping pressure of no more than 100 psi. The low pressure transfer system typically consists of an inlet structure or hopper connected to a smooth interior PVC pipe sized to deliver the design flow. This practice includes the pipe plus the inlet structure connection and all other fittings, trench excavation and backfill, labor and a equipment for installation.This conduit is part of a manure transfer system for a planned waste management or comprehensive nutrient management plan. This scenario addresses the transport of liquid waste to a waste storage or treatment to prevent a water quality resource concern of excessive nutrients/organics and harmful levels of pathogens in surface water and/or excessive nutrients/organics in ground water. Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling; PS 635, Vegetated Treatment Area PS 561, Heavy Use Area Protection; PS 629, Waste Treatment; PS 382, Fence; PS 606, Subsurface Drain; PS 620, Underground Outlet; PS 656, Constructed Wetland

Before Situation:

An area of waste production is separated from the waste storage facility and current operations may cause water quality concerns. The site of waste collection or structure has the capacity to install a pumping plant but needs a pipeline to transfer the liquid manure slurry under low pressure from the collection site to the treatment or storage structure.

After Situation:

Install a 300 foot long 6 inch diameter low pressure wastewater pipeline to transfer wastewater or manure slurry from one location to another. The low pressure flow situation refers to pipeflow that has an unrestricted outlet and low pumping head pressure. A pumping plant will send the liquid through a pipe inlet at an existing waste collection basin into a 6 inch diameter pipeline to transfer the design volume to an outlet at the wastewater treatment or storage site. This scenario includes the pipe, inlet connection, outlet, couplers and all other fittings, trench excavation, pipe bedding and backfill. The site should be evaluated by the designing engineer before contracting. If required a pumping plant may be contracted under PS 533, Pumping Plant to support this system.The low pressure transfer conduit will provide collection, transfer and containment of the manure slurry, thereby protecting water quality resources.

Feature Measure: Length of pipe installed

Scenario Unit: Feet

Scenario Typical Size: 300.00

Scenario Total Cost: $9,475.16

Scenario Cost/Unit: $31.58

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formless, non reinforced	36	Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$220.05	1	$220.05
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	5.8	$2,907.25
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	83	$209.16
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	42	$262.50
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.45	33	$113.85
Demolition, concrete	1498	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yards	$11.57	7	$80.99
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	24	$689.04
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	16	$777.60
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	14	$404.04
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.29	1181.4	$2,705.41
Mobilization						

Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 634 - Waste Transfer

Scenario: #14 - High pressure flow conduit, 100 psi or greater

Scenario Description:

High pressure flow conduit is typically a PVC pipeline used to transfer wastewater or manure slurry by pumping from one production location to a storage or treatment location. High pressure flow PVC transfer pipelines can be between 3' and 30' diameter and are designed for a pumping pressure of more than 100 psi. The high pressure transfer system typically consists of an inlet structure or hopper connected to a smooth interior PVC pipe sized to deliver the design flow. This practice includes the pipe plus the inlet structure connection and all other fittings, trench excavation and backfill, labor and a equipment for installation.This conduit is part of a manure transfer system for a planned waste management or comprehensive nutrient management plan. This scenario addresses the transport of liquid waste to a waste storage or treatment to prevent a water quality resource concern of excessive nutrients/organics and harmful levels of pathogens in surface water and/or excessive nutrients/organics in ground water. Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling; PS 635, Vegetated Treatment Area PS 561, Heavy Use Area Protection; PS 629, Waste Treatment; PS 382, Fence; PS 606, Subsurface Drain; PS 620, Underground Outlet; PS 656, Constructed Wetland

Before Situation:

An area of waste production is separated from the waste storage facility and current operations may cause water quality concerns. The site of waste collection or structure has the capacity to install a pumping plant but needs a pipeline to transfer the liquid manure slurry under low pressure from the collection site to the treatment or storage structure.

After Situation:

Install a 300 foot long 12 inch diameter high pressure wastewater pipeline to transfer wastewater or manure slurry from one location to another. A pumping plant will send the liquid through a pipe inlet at an existing waste collection basin into a 12 inch diameter pipeline to transfer the design volume to an outlet at the wastewater treatment or storage site. This scenario includes the pipe, inlet connection, outlet, couplers and all other fittings, trench excavation, pipe bedding and backfill. The site should be evaluated by the designing engineer before contracting. If required a pumping plant may be contracted under PS 533, Pumping Plant to support this system.The high pressure transfer conduit system will provide transfer and containment of the manure slurry, thereby protecting water quality resources.

Feature Measure: Length of pipe installed

Scenario Unit: Feet

Scenario Typical Size: 300.00

Scenario Total Cost: $23,988.30

Scenario Cost/Unit: $79.96

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formless, non reinforced	36	Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$220.05	1	$220.05
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	8	$4,010.00
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	150	$378.00
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	67	$418.75
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.45	80	$276.00
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	17	$1,125.06
Demolition, concrete	1498	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yards	$11.57	7	$80.99
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	24	$689.04
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	17	$682.21
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	24	$1,166.40
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	17	$490.62

Valve, Pressure Relief	1042	Materials for <2 inch Pressure Relief Valve	Each	$133.90	1	$133.90
Valve, Air Vacuum Release, Continuous	1106	Materials for <2 inch Automatic Air/Vacuum Relief Valve (3 - Way Air Vac)	Each	$201.15	1	$201.15
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.29	4893.9	$11,207.03
Valve, Safety, Shut off valve for liquid storage tank	1954	Shut off valve for liquid storage tank. Typical 12 inch diameter. Materials and shipping only.	Each	$1,039.20	1	$1,039.20
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 634 - Waste Transfer

Scenario: #16 - Earthen basin, sloped side

Scenario Description:
Installation for a wastewater collection system that includes materials and structures to collect liquids of a design volume greater than 10,000 gallons such as silage leachate, lot runoff and other contaminated liquid effluent. This may include curbs, screens, precast manholes, sumps or catch basins. The wastewater will typically be transferred from the collection basin to a vegetated treatment area through a gravity or low pressure flow conduit.Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling; PS 634, Vegetated Treatment Area; PS 561, Heavy Use Area Protection; PS 629, Waste Treatment; PS 382, Fence; PS 606, Subsurface Drain; PS 620, Underground Outlet; PS 656, Constructed Wetland; PS 656 and any Pond Sealing or Lining practice (PS 520, 521 or 522)This scenario addresses the potential for surface water and groundwater quality degradation from liquid wastewater running unchecked out of silage bunkers and off of animal feeding lots.

Before Situation:
Inadequate storage is available to collect wastewater from an operation that may contaminate surface or groundwater resources. The liquids contain few solids or limited solids that can be easily screened out without blocking the collection intake.

After Situation:
This practice scenario is suitable where the estimated design volume for wastewater transfer is greater than 10,000 gallons of contaminated liquid that may flow from silage bunkers or animal lot areas after a precipitation event. The practice scenario typically includes materials and installation of curbed concrete to collect liquids and direct it to the location where the installation of an earthen lined basin is located which is approximately 50'x50' bottom dimensions with 3:1 side slopes and is 4 deep. There is usually a 8' low pressure pipe leaving the site to a vegetated treatment area or a waste storage pond, approximately 300' long. The cost includes excavation, placement of bedding as needed, placement of structure and backfill with construction of concrete inlet collection area. Transfer pump if needed must be contracted under pumping plant, PS 533.

Feature Measure: Gallons in basin

Scenario Unit: Gallons

Scenario Typical Size: 116,526.00

Scenario Total Cost: $15,282.86

Scenario Cost/Unit: $0.13

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	23	$143.75
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.45	23	$79.35
Trenching, Earth, 12 in. x 48 in.	53	Trenching, earth, 12 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling	Feet	$1.43	300	$429.00
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$75.12	4	$300.48
Excavation, common earth, small equipment, 50 ft	1220	Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yards	$2.81	692	$1,944.52
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	32	$918.72
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	14	$404.04
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.29	1778.7	$4,073.22
Valve, Safety, Shut off valve for liquid storage tank	1954	Shut off valve for liquid storage tank. Typical 12 inch diameter. Materials and shipping only.	Each	$1,039.20	1	$1,039.20
Manure channel, precast, 3 ft. x 4 ft.	2108	Precast manure U channel; 3 ft wide x 4 ft deep. Includes materials and shipping only.	Feet	$173.64	20	$3,472.80
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	2	$607.88

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 634 - Waste Transfer

Scenario: #18 - Conveyor Belt

Scenario Description:

Installation for a manure transfer system that includes materials and structures to transfer waste from an animal facility. The solid manure will typically be transferred from the animal housing to a waste storage facility through a conveyor belt system.Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling; PS 635, Vegetated Treatment Area; PS 561, Heavy Use Area Protection; PS 629, Waste Treatment; PS 382, Fence; PS 606, Subsurface Drain; PS 620, Underground Outlet; PS 656, Constructed Wetland; PS 367, Roofs and CoversThis scenario addresses the potential for surface water and groundwater quality degradation from liquid wastewater running unchecked out of silage bunkers and off of animal feeding lots.

Before Situation:

An area of waste production is separated from the waste storage facility and current operations may contaminate surface or groundwater resources due to efficient movement of the waste to storage.

After Situation:

The practice scenario typically includes materials and installation of a conveyor belt system to transfer poultry litter to a storage facility. This scenario includes the installation of a conveyor belt type system that will transfer solids to treatment, storage or land application.

Feature Measure: Linear Foot of Conveyor

Scenario Unit: Feet

Scenario Typical Size: 100.00

Scenario Total Cost: $9,940.97

Scenario Cost/Unit: $99.41

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	2	$1,002.50
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	32	$1,403.84
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	1.2	$34.63
Manure Transfer, 100 ft. Conveyor belt system	1772	Conveyor belt system, 100 foot conveyor or vertical lift used in manure storage facility for stacking of litter. Includes materials and shipping only.	Each	$7,500.00	1	$7,500.00

Practice: 634 - Waste Transfer

Scenario: #23 - Transfer Auger

Scenario Description:
Installation for a manure transfer system where a manure auger is needed to transfer waste as a part of animal housing transfer system or waste separation, treatment or handling system. Animal waste is typically transferred from the animal housing to a reception tank where the waste is agitated to keep in suspension for further treatment and/or separation, or transferred to a liquid storage facility. This system includes only the transfer auger. Contract additional components where needed. As part of this scenario manure scraped from the animal holding lot area is pushed into a concrete channel with a horizontal auger that transfers manure to the next transfer, storage or treatment system. Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 632, Waste Separation Facility; PS 590 Nutrient Management for waste application; PS 635, Vegetated Treatment Area; PS 561, Heavy Use Area Protection; PS 629, Waste Treatment; PS 382, Fence; PS 606, Subsurface Drain; PS 620, Underground Outlet; PS 656, Constructed Wetland. This scenario addresses the potential for surface water and groundwater quality degradation from manure or wastewater running unchecked out of animal housing or temporary storage facilities.

Before Situation:
Inadequate transfer mechanism is available to collect manure from an operation that may contaminate surface or groundwater resources.

After Situation:
The practice scenario typically includes materials and installation of a transfer system where an auger is needed to move manure from the livestock housing and/or lot to further treatment, separation, or storage. Associated practice Waste Separation (632). Contract 632-Waste Separator and if needed 533-pumping plant separately

Feature Measure: feet of auger length

Scenario Unit: Feet

Scenario Typical Size: 80.00

Scenario Total Cost: $44,088.33

Scenario Cost/Unit: $551.10

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	53.3	$134.32
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	6.6	$41.25
Demolition, concrete	1498	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yards	$11.57	8	$92.56
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	16	$701.92
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	24	$689.04
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	6	$173.16
Safety gate, span manure transfer channel or chute	1952	Safety gate to span manure transfer channel at push off wall or chute outlet. Minimum of 4 ft. tall with openings that will not pass a 6 inch or larger sphere. Includes materials only.	Feet	$22.48	80	$1,798.40
Manure channel, precast, 3 ft. x 4 ft.	2108	Precast manure U channel; 3 ft wide x 4 ft deep. Includes materials and shipping only.	Feet	$173.64	80	$13,891.20
Auger, Sand/Manure	2441	System to transfer sand laden manure through a manure gutter towards a reception pit without creating a human safety hazard. Consists of a concrete gutter with a sand auger.	Feet	$305.00	80	$24,400.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26
Aggregate, Shipping, Cubic Yard-mile	2360	Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul).	Cubic Yard Mile	$0.42	360	$151.20

Practice: 634 - Waste Transfer

Scenario: #36 - Underbarn retrofit

Scenario Description:

Installation for a manure transfer system that includes materials and structures to transfer waste from a barn through a transfer channel to a tank/basin where it will then be taken to a storage. The system will typically have an 8' deep by 10' wide concrete channel under the barn that for safety reasons needs to be retro fit to avoid having individuals drive into it. It can be converted to a safer transfer in various ways, but the typical situation includes filling the tank with peagravel or sand and then installing a 3'x4' channel with an auger to transfer the sand laden manure to a collection basin and then from the collection basin to a waste storage facility through a gravity or low pressure flow conduit.Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 632, Waste Separation Facility; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling; PS 561, Heavy Use Area Protection; PS 629, Waste Treatment; PS 382, Fence; PS 606, Subsurface Drain; PS 620, Underground OutletThis scenario addresses the potential for surface water and groundwater quality degradation from liquid waste.

Before Situation:

Inadequate storage is available to collect wastewater from an operation that may contaminate surface or groundwater resources. The transfer of waste water to a waste storage facility is required for the CNMP. The transfer that is currently on site can not be safety managed.

After Situation:

This practice scenario is suitable where the existing transfer is an underbarn drive in facility that has potential for dangerous gases and can not be operated safely. The practice scenario typically includes materials and installation of a precast concrete 3' x 4' channel being installed within an existing 8 ft by 10 ft by 120 ft channel across the width of the barn. The existing channel is filled with peagravel prior to the channel being placed. The channel then outlets into a 29'x17'x10' reinforced concrete wet/dry reception pit, formed in place that includes safety fence w/gate or solid/grated cover along with 300' of 12' Sch 40 PVC pipe to storage. Pipe length for contract is increased by 10% to account for required fittings. The cost includes excavation, placement of subgrade as needed, forming, pouring and finishing of concrete structure and backfilling. Transfer pump if needed must be contracted under pumping plant, PS 533.

Feature Measure: Length of existing channel

Scenario Unit: Feet

Scenario Typical Size: 120.00

Scenario Total Cost: $140,584.16

Scenario Cost/Unit: $1,171.53

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	75	$42,531.00
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	56	$350.00
Trenching, Earth, loam, 24 in. x 48 in.	54	Trenching, earth, loam, 24 inch wide x 48 inch depth, includes equipment and labor for trenching and backfilling	Feet	$3.06	300	$918.00
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	72	$4,764.96
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	16	$1,252.80
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$75.12	16	$1,201.92
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	16	$701.92
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	20	$574.20
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	16	$485.76
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	88	$3,531.44
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	80	$3,888.00
Materials						
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$23.32	18	$419.76

Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.29	3336.3	$7,640.13
Pipe, smooth steel, weight priced	1325	Smooth Steel pipe priced by the weight of the pipe materials. Materials only.	Pound	$3.47	363.6	$1,261.69
Aggregate, gravel, washed, pea gravel	1331	Washed and graded pea gravel river stone. Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$32.50	302.2	$9,821.50
Safety chain tractor barrier	1725	3/8 in. transport chain barrier installed to prevent tractor equipment from entering wastewater collection basin or pit. Material cost only.	Feet	$3.60	106	$381.60
Manure channel, precast, 3 ft. x 4 ft.	2108	Precast manure U channel; 3 ft wide x 4 ft deep. Includes materials and shipping only.	Feet	$173.64	120	$20,836.80
Auger, Sand/Manure	2441	System to transfer sand laden manure through a manure gutter towards a reception pit without creating a human safety hazard. Consists of a concrete gutter with a sand auger.	Feet	$305.00	120	$36,600.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	2	$364.16
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	4	$3,058.52

Practice: 634 - Waste Transfer

Scenario: #45 - Concrete Channel

Scenario Description:

Installation of a concrete channel that consists of a slab with curb and footing on each side of the slab for the entire length of the channel to enable the facility manager to direct liquid waste to an existing collection basin and/or waste storage facility. Water quality concerns will be addressed by preventing liquid waste from entering surface waters, and to facilitate timely land application of manure and wastewater at agronomic rates according to the CNMP. This scenario addresses the potential for surface water and groundwater quality degradation. Associated practices may include: PS 313 Waste Storage Facility; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management; PS 633, Waste Recycling.

Before Situation:

Current facility operations are allowing liquid waste to flow uncontrolled during periods of precipitation events or cleaning operations such that water resources can be contaminated.

After Situation:

Typical installation of a 12 foot wide 100' long concrete channel that consists of a 5' thick concrete slab with curbing on each side of the slab that is 2' high, 6' thick with footing for the entire length. The purpose is to transfer liquids or manure slurry from one area to an existing collection basin or waste storage facility. Includes safety chain for equipment.Alternative configurations can consist of the installation of a more narrow or wider channel that may or may not have curbs or a deeper shaped channel and may include a half pipe on the bottom.

Feature Measure: Bottom surface area of concrete ch

Scenario Unit: Square Feet

Scenario Typical Size: 1,200.00

Scenario Total Cost: $25,021.80

Scenario Cost/Unit: $20.85

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	22	$11,027.50
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	11	$6,237.88
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	8	$626.40
Demolition, concrete	1498	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yards	$11.57	4	$46.28
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	64	$1,837.44
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	8	$321.04
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	50	$2,430.00
Materials						
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$23.32	26	$606.32
Safety gate, span manure transfer channel or chute	1952	Safety gate to span manure transfer channel at push off wall or chute outlet. Minimum of 4 ft. tall with openings that will not pass a 6 inch or larger sphere. Includes materials only.	Feet	$22.48	16	$359.68
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 634 - Waste Transfer

Scenario: #46 - Wastewater Flush Transfer System, Pipes only, 12 inch diameter

Scenario Description:

Installation of the pipe for a manure and wastewater flush system that provides the structures to utilize recycled wastewater to flush waste from a concrete surface into a waste storage pond. This may include pipe and valves, concrete flush lane, concrete curbs or gutter. The animal waste will be transferred by recycled flush water through the pipe system to rinse the concrete surface and carry the waste to a waste storage pond.Associated practices may include: PS 313 Waste Storage Facility; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management; PS 633, Waste Recycling.

This scenario addresses the potential for surface water and groundwater quality degradation from animal waste.

Before Situation:

An animal production facility does not have an efficient method for collecting and transferring the animal waste produced. Wastewater however is available in a sufficient quantity to provide a flush cycle to clean the production floor and collect the waste materials deposited.

After Situation:

This practice scenario is suitable where wastewater can be recycled for a flush system. Supplemental piping is needed to install the recycled flush water as a means to collect the animal waste deposited on the concrete surfaces. The pipe design for the flush volume requires100 feet of 12 inch diameter pipe for pressure flow. The flushed wastes are then piped from an existing collection basin to the waste storage pond an estimated length of 200 feet through a 12 inch diameter low pressure pipe with an open outlet at the pond. The cost includes excavation, placement of bedding as needed, flush and conveyance pipelines with valves and pipe backfill. Pumps must be contracted under pumping plant, PS 533.

Feature Measure: Flush - pipes

Scenario Unit: Feet

Scenario Typical Size: 300.00

Scenario Total Cost: $21,010.06

Scenario Cost/Unit: $70.03

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	8	$4,010.00
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	66	$412.50
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	30	$1,985.40
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$75.12	8	$600.96
Demolition, concrete	1498	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yards	$11.57	4	$46.28
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	70	$2,009.70
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	8	$242.88
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	30	$1,203.90
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	35	$1,701.00
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	10	$288.60
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$23.32	6	$139.92
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.29	2721.3	$6,231.78
Mobilization						

Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	2	$607.88
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 634 - Waste Transfer

Scenario: #58 - Reception Tank

Scenario Description:

Installation of a reception tank as part of a waste transfer system or waste separation system. A reception tank structure is used to transfer animal waste from animal housing; to address runoff from a bunker silo or animal feeding lot prior to storage, treatment or land application. Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 632, Waste Separation Facility; PS 590 Nutrient Management for waste application; PS 635, Vegetated Treatment Area; PS 561, Heavy Use Area Protection; PS 629, Waste Treatment; PS 382, Fence; PS 606, Subsurface Drain; PS 620, Underground Outlet; PS 656, Constructed Wetland, This scenario addresses the potential for surface water and groundwater quality degradation from liquid wastewater running unchecked out of animal housing, silage bunkers and off of animal feeding lots.

Before Situation:

Inadequate waste transfer mechanism is available to collect manure, wastewater or contaminated runoff from an operation that may contaminate surface or groundwater resources. The waste contain few solids or limited solids.

After Situation:

This scenario is a reinforced concrete reception tank. The scenario includes a slab, curing and formed reinforced concrete with some transfer pipe. A transfer channel is 30ft x 2 ft r/c curbing on both sides to move waste into a 24ft wide x 28 ft long x 10 ft deep formed in place reinforced concrete reception tank (12 inch thick walls). The reception tank includes the safety barrier around the tank with 12' schd 40 PVC transfer pipe and shut off valving. The cost includes excavation, placement of subgrade materials, forming, pouring and finishing of the concrete transfer components, backfiling and pipe installation. Contract other components as needed.

Feature Measure: Volume of the Reciption Tank

Scenario Unit: Cubic Feet

Scenario Typical Size: 6,720.00

Scenario Total Cost: $75,813.55

Scenario Cost/Unit: $11.28

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	17.6	$8,822.00
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	92	$52,171.36
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	514	$1,295.28
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	38.6	$241.25
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	32	$2,117.76
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	24	$1,052.88
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	16	$459.36
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	32	$971.52
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	24	$1,166.40
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	38.6	$1,114.00
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.29	606.6	$1,389.11
Safety gate, span manure transfer channel or chute	1952	Safety gate to span manure transfer channel at push off wall or chute outlet. Minimum of 4 ft. tall with openings that will not pass a 6 inch or larger sphere. Includes materials only.	Feet	$22.48	104	$2,337.92

Valve, Safety, Shut off valve for liquid storage tank	1954	Shut off valve for liquid storage tank. Typical 12 inch diameter. Materials and shipping only.	Each	$1,039.20	1	$1,039.20
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Aggregate, Shipping, Cubic Yard-mile	2360	Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul).	Cubic Yard Mile	$0.42	1640	$688.80

Practice: 634 - Waste Transfer

Scenario: #59 - Directional Boring

Scenario Description:

200 feet of 12' low pressure pipeline installed by boring through road bed or under streams to transfer wastewater or manure slurry from production locations to storage or treatment location. Typical trencher or plowing installation is not possible due to site disturbance or environmental concerns. This item includes installation, and labor required to construct and install the pipeline. Cost of pipeline and fittings is not included. Revegetation is not included. This scenario addresses the transport of liquid waste to a waste storage or treatment to prevent a water quality resource concern of excessive nutrients/organics and harmful levels of pathogens in surface water and/or excessive nutrients/organics in ground water. The site should be evaluated by the designing engineer before contracting. Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management (for waste application); PS 633, Waste Recycling; PS 635, Vegetated Treatment Area; PS 561, Heavy Use Area Protection; PS 629, Waste Treatment; PS 382, Fence; PS 606, Subsurface Drain; PS 620, Underground Outlet; PS 656, Constructed Wetland

Before Situation:

An area of waste production is separated from the waste storage facility and current operations may cause water quality concerns. The site of waste collection or structure has the capacity to install a pumping plant but needs a pipeline to transfer the liquid manure slurry under low pressure from the collection site to the treatment or storage structure. The pipeline needs to be installed under a township road and trenching is not a viable option.

After Situation:

The 200 feet of 12' diameter PVC pipe will be installed under roads or streams at a depth of 60' or more to avoid unnecessary disturbance. A pumping plant will send the liquid through a pipe inlet at an existing waste collection basin into a 12 inch diameter pipeline to transfer the design volume to an outlet at the wastewater treatment or storage site. This scenario includes the cost of the directional boring and labor only. Pipe, fittings and all other component are paid under 634 Pipe only or Pipe and Basin. If required a pumping plant may be contracted under PS 533, Pumping Plant to support this system. The low pressure transfer conduit will provide collection, transfer and containment of the manure slurry, thereby protecting water quality resources and to meet the water quality resource concerns.

Feature Measure: Length of Pipe installed with Boring

Scenario Unit: Feet

Scenario Typical Size: 200.00

Scenario Total Cost: $24,979.94

Scenario Cost/Unit: $124.90

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Horizontal Boring, Greater Than 3 in. diameter	1132	Includes equipment, labor and setup.	Feet	$123.38	200	$24,676.00
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 634 - Waste Transfer

Scenario: #70 - High pressure land application flow conduit

Scenario Description:

High pressure flow conduit is typically a HDPE pipeline used to transfer wastewater or manurer slurry by pumping plant from a strorage location to a land application delivery point. High pressure flow HDPE transfer pipelines range in size of 6-inch and 15-inch (typical is 10 inch) diameter and are designed for a pumping pressure of more than 200 psi. A 1/4 mile long 10-inch DR 17 HDPE pipe is used to transport waste from the storage facility to two delivery points located in fields receiving the waste. The pipe trench is 6 ft deep with the top 2 feet benched for safety. Appurtences inlude the inlet, elbows with thrust block, and the delivery point. The inlet includes connection to the pumping plant, an air vent, a pressure relief valve plumbed to discharge back into the storage pit, and a thrust block.A delivery point includes a riser with a thrust block, an air vent, and a hydrant that may be connected to the land application system. This scenario safely transports liquid water from the storage facility to the land application delivery point to prevent a water quality resource concern, harmful pathogens in surface water, and excessive nutrients/organics in groundwater. Associated practices may include: PS 590 Nutrient Management for waste application, PS 313 Waste Storage Facility, for storage structures, PS 533 Pumping Plant, PS 430 Irrigation Pipeline, PS 561 Heavy Use Protection, PS 422 Sprinkler System, PS 449 Irrigation Water Management, PS 632 Waste Separation Facility, PS 633 Water Recycling, and PS 382 Fence.

Before Situation:

Stored wastewater or manure slurry is pumped into tank and transported by tractor to the field where it is land applied, causing soil compaction and soil erosion in the crop fields.

After Situation:

Stored wastewater or manure slurry is pumped into a permanent, fused pipeline to the field where it is land applied. The typical pipeline is a 10-inch DR17 HDPE pipeline that is connected to a pumping plant manifold located at the storage facility and a delivery point located at the field. This scenario includes the pipe, inlet connection, delivery point, fittings, trench excavation, pipe bedding, and backfill. This scenario assumes that the pipe will cross land only owned or leased by the landowner. No right-of-way costs are included in this scenario. The site should be evaluated by the designing engineer before contracting. If required, a pumping plant may be contracted under CPS 533, Pumping Plant to support the system. The high-pressure transfer conduit system will provide a safe transfer and containment of the waste stream, thereby protecting water quality resources.

Feature Measure: Length of Pipe Installed

Scenario Unit: Feet

Scenario Typical Size: 1,320.00

Scenario Total Cost: $93,716.18

Scenario Cost/Unit: $71.00

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formless, non reinforced	36	Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$220.05	2	$440.10
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	1	$501.25
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	929	$2,341.08
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	218	$1,362.50
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.45	711	$2,452.95
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	34	$2,250.12
Fuser for HDPE Pipe	1383	Fusing machine for 1 to 12 inch diameter HDPE pipe joints. Equipment costs only. Does not include labor.	Hours	$28.59	17	$486.03
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	17	$745.79
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	68	$1,952.28
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	34	$1,364.42
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	34	$1,652.40
Materials						

Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	2	$57.72
Valve, Pressure Relief	1042	Materials for <2 inch Pressure Relief Valve	Each	$133.90	1	$133.90
Valve, Air Vacuum Release, Continuous	1106	Materials for <2 inch Automatic Air/Vacuum Relief Valve (3 - Way Air Vac)	Each	$201.15	2	$402.30
Pipe, HDPE, smooth wall, weight priced	1379	High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only.	Pound	$3.59	20606	$73,975.54
Dry Hydrant head assembly, 6 in. PVC, 90 degree	2288	Dry Hydrant assembly for 6 inch PVC pipe consisting of 90 degree pipe elbow, bronze insert with 6-inch NST male thread, rubber 'O' ring, threaded cap, conical strainer, and end cap. Material cost only.	Each	$560.01	2	$1,120.02
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	2	$607.88
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 635 - Vegetated Treatment Area

Scenario: #1 - VTA downslope from collection point, Fill Present on Site

Scenario Description:
An existing area downslope of the wastewater collection area to be used as an overland or channelized flow area for nutrient rich runoff treatment. A flow distribution component is installed to achieve sheet flow at the start of the VTA. There is an adequate amount of suitable material (typically at least 20% passing the No. 200 sieve) are available onsite to grade and shape the treatment area. Clean runoff is diverted where possible. The VTA vegetation is harvested to removed nutrients on a regular basis. This practice addresses water quality degradation due to uncontrolled nutrient rich wastewater that can flow into surface waters or leach into ground water. Associated practices: Critical Area Planting (342), Diversion (362), Fence (382), Irrigation System, Surface and Subsurface (443), Land Smoothing (466), Waste Transfer (634), Mulching (484), Nutrient Management (590), Precision Land Forming and Smoothing (462), Pumping Plant (533), Roof Runoff Structure (558), Stormwater Runoff Control (570), Subsurface Drain (606), Terrace (600), Underground Outlet (620), Waste Separation Facility (632), Waste Storage Facility (313), Waste Treatment (629), Wastewater Treatment- Milkhouse (627)

Before Situation:
Nutrient rich wastewater is running off from an animal operation that has the potential to pollute surface waters or ponding and leaching into groundwater.

After Situation:
Typical VTA is 30 feet wide by 300 feet long. A 1 foot high concrete spreader wall is installed across the top of the treatment area in order to provide distribution flow (sheet flow) into the VTA. Three rock checks 1.5 ft deep by 3 ft wide are provided in the treatment area to maintain sheet flow. Turf reinforcement mat and erosion control blanket is installed to protect the system during establishment. VTA's typically require grading and shaping but additional fill is not needed. Minimal containment dikes, 1ft high and 4' wide, are provided along each side of the treatment area. More substantial dikes needed to direct flow toward the area or to prevent clean water from flowing into the treatment area should be contracted using Diversion (362). Critical Area Planting (342) must be contracted for seeding of site. A settling basin for wastewater collection is contracted using Waste Separation Facility (632). For milkhouse waste, Wastewater Treatment-Milkhouse (627) should be contracted to provide pre-treatment prior to being released into the VTA. Fence needed to exclude livestock should be contracted using Fence (382). The VTA practice will provide a controlled release of nutrient rich wastewater into a designed vegetative area for nutrient uptake. This system will improve water quality by treating nutrient rich wastewater and prevent contamination of surface and ground water resources.

Feature Measure: Area of VTA Installed

Scenario Unit: Square Feet

Scenario Typical Size: 9,000.00

Scenario Total Cost: $15,392.56

Scenario Cost/Unit: $1.71

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	1	$501.25
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	2	$1,134.16
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.11	154	$170.94
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	57	$143.64
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	1	$6.25
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.45	267	$921.15
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	7.5	$587.25
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	16	$459.36
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	7.5	$300.98
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	1	$28.86
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	17	$516.12

Turf reinforcement mat	1212	Synthetic turf reinforcement mat with staple anchoring. Includes materials, equipment and labor.	Square Yard	$9.50	734	$6,973.00
Erosion Control Blanket, biodegradable	1213	Biodegradable erosion control blanket, typically a composite of natural fibers with reinforcing polymer netting. Materials and shipping only.	Square Yard	$1.65	954	$1,574.10
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	3	$546.24
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 635 - Vegetated Treatment Area

Scenario: #3 - Wastewater Pumped Uphill with Gravity Outflow to VTA

Scenario Description:

This is an area or channel located upslope from the wastewater collection area. The topography of the site requires wastewater to be pumped uphill to the VTA designed system. Wastewater is properly collected at the production area and pumped uphill where the water is dissipated and has a controlled gravity outflow into the VTA. The VTA vegetation is harvested to removed nutrients on a regular basis. This practice addresses water quality degradation due to uncontrolled nutrient rich wastewater that can flow into surface waters or leach into groundwater. Associated practices: Critical Area Planting (342), Diversion (362), Fence (382), Land Smoothing (466), Waste Transfer (634), Mulching (484), Nutrient Management (590), Precision Land Forming and Smoothing (462), Pumping Plant (533), Roof Runoff Structure (558), Stormwater Runoff Control (570), Subsurface Drain (606), Terrace (600), Underground Outlet (620), Waste Separation Facility (632), Waste Storage Facility (313), Waste Treatment (629), Wastewater Treatment- Milkhouse (627).

Before Situation:

Nutrient rich wastewater is running off from an animal operation that has the potential to pollute surface waters or ponding and leaching into groundwater.

After Situation:

Typical VTA is 40 feet wide by 300 feet long. The VTA is upslope from the production area and includes a concrete dissipation structure to slow the water flow down before it enters the VTA by gravity with a concrete level spreader that is backed with rock (rock check) to obtain sheet flow at the head of the VTA. The VTA typically requires grading, shaping, and three rock checks 1.5 ft high by 3 ft wide to maintain sheet flow throughout the VTA channel. Turf reinforcement mat and erosion control blanket is installed to protect the system during establishment of vegetation. A settling basin for wastewater collection is contracted using Waste Separation Facility (632) along with Pumping Plant (533) to get the wastewater upslope to the dissipation structure and VTA. For milkhouse waste, Wastewater Treatment - Milkhouse (627) may be contracted to provide pretreatment prior to being released onto the VTA. The VTA practice will provide a controlled release of nutrient rich wastewater into a designed vegetative area for nutrient uptake. This system will improve water quality by treating nutrient rich wastewater and preventing contamination of surface and groundwater resources.

Feature Measure: Length of VTA installed

Scenario Unit: Linear Feet

Scenario Typical Size: 300.00

Scenario Total Cost: $29,193.18

Scenario Cost/Unit: $97.31

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	8	$4,010.00
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	13	$7,372.04
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.11	206	$228.66
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	95	$239.40
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	10	$62.50
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.45	267	$921.15
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	8.5	$665.55
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	16	$459.36
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	8.5	$341.11
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	10	$288.60
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	23	$698.28
Turf reinforcement mat	1212	Synthetic turf reinforcement mat with staple anchoring. Includes materials, equipment and labor.	Square Yard	$9.50	978	$9,291.00

Erosion Control Blanket, biodegradable	1213	Biodegradable erosion control blanket, typically a composite of natural fibers with reinforcing polymer netting. Materials and shipping only.	Square Yard	$1.65	1076	$1,775.40
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	3	$546.24
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	3	$2,293.89

Practice: 635 - Vegetated Treatment Area

Scenario: #4 - Mechanical Distribution

Scenario Description:

This is a permanent herbaceous vegetative area located adjacent to a livestock production area. Wastewater (runoff or milking parlor wastewater) is properly collected at the production area and pumped to mechanically distribute wastewater onto the VTA. The VTA vegetation is harvested to removed nutrients on a regular basis. This practice addresses water quality degradation due to uncontrolled nutrient rich wastewater that can flow into surface waters or leach into ground water. Associated practices: Critical Area Planting (342), Diversion (362), Fence (382), Land Smoothing (466), Manure Transfer (634), Mulching (484), Nutrient Management (590), Pipeline (516), Precision Land Forming (462), Pumping Plant (533), Roof runoff Management (558), Stormwater Runoff Control (570), Subsurface Drain (606), Terrace (600), Underground Outlet (620), Waste Separation Facility (632), Waste Storage Facility (313), Waste Treatment (629)

Before Situation:

Nutrient rich wastewater is running off from an animal operation that has the potential to pollute surface waters or ponding and leaching into groundwater.

After Situation:

Typical VTA is 1.0 ac in size, includes the sizing, grading and shaping of the VTA area. Typically requires grading and shaping to maintain sheet flow onto the VTA. A settling basin for wastewater collection is contracted using Solid/Liquid Waste Separation Facility (632) and Pumping Plant (533). For milkhouse waste, Waste Treatment (629) could be contracted to provide pretreatment prior to being pumped and distributed onto the VTA. The VTA practice will provide a controlled release of nutrient rich wastewater into a designed vegetative area for nutrient uptake. This system will improve water quality by treating nutrient rich wastewater and prevent contamination of surface and ground water resources.

Feature Measure: Amount of VTA installed

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $12,770.62

Scenario Cost/Unit: $12,770.62

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	16	$1,252.80
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	16	$459.36
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	16	$642.08
Materials						
Irrigation, Solid Set, w/Appurtenances	324	Solid Set irrigation system that includes pipe, sprinklers, connections, and appurtenances.	Acres	$5,677.09	1	$5,677.09
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.29	358	$819.82
Surge Valve And Controller	1477	Surge Valve and Controller, with appurtenances. Material cost includes valve, controller, all appurtenances, and mobilization.	Each	$3,154.84	1	$3,154.84
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 635 - Vegetated Treatment Area

Scenario: #13 - VTA downslope from collection point, Haul in Fill

Scenario Description:
An existing area downslope of the wastewater collection area to be used as an overland or channelized flow area for nutrient rich runoff treatment. A flow distribution component is installed to achieve sheet flow at the start of the VTA. There is not enough suitable material available onsite to grade and shape the treatment area, so earthfill must be brought in to cover the treatment area to meet the requirements in the practice standard. Clean runoff is diverted where possible. The VTA vegetation is harvested to removed nutrients on a regular basis. This practice addresses water quality degradation due to uncontrolled nutrient rich wastewater that can flow into surface waters or leach into groundwater. Associated practices: Critical Area Planting (342), Diversion (362), Fence (382), Irrigation System, Surface and Subsurface (443), Land Smoothing (466), Waste Transfer (634), Mulching (484), Nutrient Management (590), Precision Land Forming and Smoothing (462), Pumping Plant (533), Roof Runoff Structure (558), Stormwater Runoff Control (570), Subsurface Drain (606), Terrace (600), Underground Outlet (620), Waste Separation Facility (632), Waste Storage Facility (313), Waste Treatment (629), Wastewater Treatment- Milkhouse (627)

Before Situation:
Nutrient rich wastewater is running off from an animal operation that has the potential to pollute surface waters or ponding and leaching into groundwater.

After Situation:
Typical VTA is 30 feet wide by 300 feet long. Clean specified earthfill is brought in to a depth of 1 foot and placed across the entire treatment area once the area is striped of vegetation. A 1 foot high concrete spreader wall is installed across the top of the treatment area in order to provide distribution flow (sheet flow) into the VTA. Three rock checks 1.5 ft deep by 3 ft wide are provided in the treatment area to maintain sheet flow. Turf reinforcement mat and erosion control blanket is installed to protect the system during establishment. Minimal containment dikes, 1ft high and 4' wide, are provided along each side of the treatment area. More substantial dikes needed to direct flow toward the area or to prevent clean water from flowing into the treatment area should be contracted using Diversion (362). Critical Area Planting (342) must be contracted for seeding of site. A settling basin for wastewater collection is contracted using Waste Separation Facility (632). For milkhouse waste, Waste Treatment (629) could be contracted to provide pre-treatment prior to being released into the VTA. Fence needed to exclude livestock should be contracted using Fence (382). The VTA practice will provide a controlled release of nutrient rich wastewater into a designed vegetative area for nutrient uptake. This system will improve water quality by treating nutrient rich wastewater and prevent contamination of surface and ground water resources.

Feature Measure: Area of VTA channel

Scenario Unit: Square Feet

Scenario Typical Size: 9,000.00

Scenario Total Cost: $22,366.48

Scenario Cost/Unit: $2.49

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$501.25	1	$501.25
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	2	$1,134.16
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$1.11	154	$170.94
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	57	$143.64
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic Yards	$6.25	1	$6.25
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.45	267	$921.15
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	7.5	$587.25
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	16	$459.36
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	7.5	$300.98
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	1	$28.86
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	17	$516.12

Turf reinforcement mat	1212	Synthetic turf reinforcement mat with staple anchoring. Includes materials, equipment and labor.	Square Yard	$9.50	734	$6,973.00
Erosion Control Blanket, biodegradable	1213	Biodegradable erosion control blanket, typically a composite of natural fibers with reinforcing polymer netting. Materials and shipping only.	Square Yard	$1.65	954	$1,574.10
Earthfill Material, purchased, topsoil	2745	Purchased topsoil or screened loam. Material only.	Cubic Yards	$20.88	334	$6,973.92
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	3	$546.24
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 635 - Vegetated Treatment Area

Scenario: #19 - Existing Area, Pod Sprinkler System Distribution

Scenario Description:

This is a permanent herbaceous vegetative area located adjacent to a livestock production area. Wastewater (runoff or milking parlor wastewater) is properly collected at the production area and pumped to mechanically distribute wastewater onto the VTA. The VTA vegetation is harvested to removed nutrients on a regular basis. This practice addresses water quality degradation due to uncontrolled nutrient rich wastewater that can flow into surface waters or leach into ground water. Associated practices: Waste Storage Facility (313), Fence (382), Waste Separation Facility (632), Manure Transfer (634), Irrigation System, Sprinkler (442), Roof runoff Management (558), Pumping Plant (533), Subsurface Drain (606), Critical Area Planting (342), Terrace (600), Nutrient Management (590), Diversion (362), Pipeline (516), Land Smoothing (466), Precision Land Forming (462), Waste Treatment (629)

Before Situation:

Nutrient rich wastewater is running off from an animal operation that has the potential to pollute surface waters or ponding and leaching into groundwater.

After Situation:

Typical VTA is 2.0 ac in size. Typically does not require grading and shaping to maintain as uniform application onto the VTA is made through a mobile pod type sprinkler system. A settling basin for wastewater collection is contracted using Solid/Liquid Waste Separation Facility (632) and Pumping Plant (533) to get the wastewater to the VTA. The system is sized such that the total number of Pods will distribute wastewater to half of the VTA, 1 ac. The pods will be relocated to distribute wastewater to the other half of the VTA. The VTA is 400 ft x 220 ft. A 400 ft pipeline with 8 risers spaced 50 ft apart extends down one side of the VTA. Each Pod Line is 200 ft long with 5 pods spaced at 40 ft increments. The total number of Pods is 20 (8 risers/2 x 5 pods/line = 20 pods). For milkhouse waste, Waste Treatment (629) could be contracted to provide pretreatment prior to being pumped and distributed onto the VTA. The VTA practice will provide a controlled release of nutrient rich wastewater onto a designed vegetative area for nutrient uptake. This system will improve water quality by treating nutrient rich wastewater and prevent contamination of surface and ground water resources.

Feature Measure: Amount of VTA installed

Scenario Unit: Acres

Scenario Typical Size: 2.00

Scenario Total Cost: $13,217.81

Scenario Cost/Unit: $6,608.91

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Trencher, 8 in.	936	Equipment and power unit costs. Labor not included.	Hours	$50.98	8	$407.84
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	16	$459.36
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	8	$242.88
Materials						
Irrigation, Pod System, w/Appurtenances	323	Pod irrigation system that includes pod, pipe, sprinklers, connections, and appurtenances. Includes materials only.	Each	$384.85	20	$7,697.00
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.29	791.8	$1,813.22
Ball Valve, 4 in.	1726	4 inch ball valve, metal body. Materials only.	Each	$229.11	8	$1,832.88
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 636 - Water Harvesting Catchment

Scenario: #22 - Surface Catchment

Scenario Description:
Construct an apron, approximately 50 feet wide by 90 feet long, utilizing: a plastic or rubber membrane laid on a prepared ground surface; or an asphalt or concrete surface with curbing; to collect rain water. Divert collected water from the surface catchment by gravity through an 8' diameter, PVC SDR-35 pipe to an existing tank or plastic-lined earthen reservoir. Exclusion of animals is required, so conservation practice 382 - Fencing, may be needed to protect the catchment. Resource Concern: Livestock production limitation - Inadequate livestock water.Associated Practices: 382 - Fencing; 614 - Watering Facility; 436 - Irrigation Reservoir; and 521A - Pond Sealing or Lining, Flexible Membrane.

Before Situation:
Inadequate water available to address resource concerns. Client hauls water to supply needs.

After Situation:
Design and construct an impervious surface as the primary collection component, and a pipe to convey the water to create a reliable water supply for livestock.

Feature Measure: Surface Area of Catchment

Scenario Unit: Square Yard

Scenario Typical Size: 500.00

Scenario Total Cost: $9,130.57

Scenario Cost/Unit: $18.26

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	12	$939.60
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	24	$689.04
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	12	$481.56
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	24	$1,166.40
Materials						
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.29	593.6	$1,359.34
Synthetic Liner, 40 mil	1387	Synthetic 40 mil HDPE, LLDPE, EPDM, etc membrane liner material. Includes materials and shipping only.	Square Yard	$7.46	500	$3,730.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 636 - Water Harvesting Catchment

Scenario: #23 - Elevated Catchment

Scenario Description:

Build a wooden frame, 'post-and-pier' structure, with a corrugated metal roof (dimensions are 24 feet wide by 20 feet long), to collect rain water. The structure is supported by 9-each, 'poured-in-place', concrete footings (dimensions are 2'x2' square x1' thick), 8 feet on-center, with tie-down straps. Divert collected water from catchment area with guttering and downspout through a 4' diameter PVC Schedule 40 pipe, to a tank (not included)for a reliable storage and subsequent use. Resource concerns: Livestock production limitation - Inadequate livestock water; Insufficient water - Inefficient use of irrigation water.Associated practices: 382 - Fence; 614 - Watering Facility; or 436 - Irrigation Reservoir.

Before Situation:

Inadequate water available to address resource concerns. Client hauls water to supply needs.

After Situation:

The guttering and downspouts collects the roof runoff and the water is conveyed through a pipe, by gravity, to a storage tank for use by livestock or a very small irrigation system. This system is the primary collection component of a Water Harvesting Catchment (CPS 636) facility. Divert collected water from roof with guttering and downspout through a 4' diameter PVC Sch-40 pipe,

Feature Measure: Surface Area of Catchment

Scenario Unit: Square Yard

Scenario Typical Size: 53.00

Scenario Total Cost: $10,567.59

Scenario Cost/Unit: $199.39

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$567.08	1.5	$850.62
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	4	$264.72
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	120	$5,264.40
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	1	$40.13
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	40	$1,944.00
Materials						
Dimension Lumber, Treated	1044	Treated dimension lumber with nominal thickness equal or less than 2 inches. Includes lumber and fasteners	Board Feet	$1.79	512	$916.48
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.29	214.8	$491.89
Gutter, Downspout, PVC, 5 in.	1388	5 inch PVC guttering. Materials only.	Feet	$1.28	24	$30.72
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 636 - Water Harvesting Catchment

Scenario: #24 - Plastic tank, less than or equal to 1,000 gallons

Scenario Description:

Install a small, typically 1,000 gallons or less, above-ground polyethylene tank to store rainwater from an impervious surface on 6' of well-compacted drain rock or a 4' thick reinforced concrete support pad. The typical dimensions of the tank are 72' in diameter and 66' tall. The scenario also assumes a 96' diameter gravel base or concrete pad to extend a minimum of 12' past the base of tank for adequate foundation support. Stored water can be used with watering facilities, irrigation systems, or other conservation practices. The tank shall be constructed of approved materials that stores adequate quantity and quality of water for storage and or direct drinking access. Additional components may be needed to channel water from the impervious surface to the storage tank. All components used will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. Resource concerns addressed include: Inadequate water quantity for livestock, wildlife or crops; habitat degradation, water quality, and undesirable plant productivity and health. Associated Practices: 614 - Watering Facility; 516 - Livestock Pipeline; 558 - Roof Runoff Structure; 620 - Underground Outlet; 430 - Irrigation Pipeline; 441 - Micro Irrigation; 533 - Pumping Plant; 342 - Critical Area Planting; 382 - Fencing

Before Situation:

Impervious surface currently exists, but there is no storage available. Water quantity is not available or supplemented to provide for wildlife, livestock watering, irrigation, or for other conservation practices.

After Situation:

A 1,000 gallon above-ground Poly tank with all tank materials, stabilized in place, with overflow protection, is installed to collect and store water from an impervious surface. Tank will provide or support adequate water storage capacity to ensure against inadequate supply of water for livestock and or wildlife, habitat degradation, water quality, water quantity, crops, and undesirable plant productivity and health, and provide conservation benefit.

Feature Measure: Gallons of Tank Storage Capacity

Scenario Unit: Gallons

Scenario Typical Size: 1,000.00

Scenario Total Cost: $2,511.16

Scenario Cost/Unit: $2.51

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hydraulic Excavator, .5 CY	930	Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included.	Hours	$101.18	1	$101.18
Plate compactor	1915	Manually guided vibratroy plate compactor. Equipment only.	Hours	$19.02	1	$19.02
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	2	$57.42
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	2	$60.72
Materials						
Tank, Poly enclosed Storage, 300-1000 gal	1074	Water storage tanks. Includes materials and shipping only.	Gallons	$1.68	1000	$1,680.00
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$23.32	1	$23.32
Cable, Galvanized steel	2182	Galvanized steel aircraft cable in 7 x 19 strand core. Materials and shipping only.	Feet	$0.68	40	$27.20
Anchor, earthen, low disturbance, large	2184	Low disturbance, galvanized or aluminum alloy earthen anchors with holding power greather than 3,000 pounds in normal soil. Materials and shipping only.	Each	$59.59	4	$238.36
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 638 - Water and Sediment Control Basin

Scenario: #1 - Berm less than 4 feet tall, grassed

Scenario Description:

Typical scenario is for the construction of 3 basins, each with 150 lineal feet of earthen embankment with 3 ft top width and approximately 3:1 side slopes. The average height is approximately 2.8 ft and average volume is 1.18 CY/ft. Outlet is typically an underground outlet. An earthen embankment is constructed across the slope and minor watercourses to form a sediment trap and water detention basin. Work is done with dozer, scraper, or road grader. Costs include all equipment necessary to excavate, shape, grade and compact the Water and Sediment Control Basin, establish permanent vegetation and mobilization of equipment. This practice is utilized to reduce watercourse and gully erosion, trap sediment, reduce and manage onsite and downstream runoff. Sheet and rill erosion will be controlled by other conservation practices. Height is measured on centerline at low point.

Before Situation:

Farming fields with excessive slope length has resulted in multiple rills and/or ephemeral gullies that will continue to worsen over time. The excessive erosion may lead to deterioration of receiving waters due to excessive sedimentation and nutrient transport. Resource concern addressed includes soil erosion and water quality by trapping sediment and/or reduce erosion in a field to protect riparian areas and water bodies from sediment deposition. Surface water causes erosion and the sediment (and potentially pesticides) to be transported into the riparian areas and water bodies downstream.

After Situation:

Water and Sediment Control Basis is constructed with an average of 1.18 CY of earthfill per lineal foot with dozer, scraper and/or road grader. Rill and/or gully erosion is reduced. If riser and underground outlet are needed, then include Underground Outlet (620). Include Critical Area Planting (342) where necessary to prevent erosion following construction activities. Associated Practices: Critical Area Planting (342), Stormwater Runoff Control (570), and Underground Outlet (620)

Feature Measure: Linear feet

Scenario Unit: Feet

Scenario Typical Size: 450.00

Scenario Total Cost: $2,962.16

Scenario Cost/Unit: $6.58

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	531	$2,129.31
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	0.4	$5.95
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.61	0.2	$1.52
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	0.2	$4.45
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$10.18	0.2	$2.04
Materials						
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	12	$8.16
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.81	12	$9.72
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	12	$8.16
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$26.18	0.4	$10.47
Introduced Perennial Grasses, Legumes and/or Forbs, High Density	2749	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping.	Acres	$88.70	0.2	$17.74
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 638 - Water and Sediment Control Basin

Scenario: #2 - Berm less than 4 feet tall, farmed

Scenario Description:

Typical scenario is for the construction of 3 basins, each with 150 lineal feet of earthen embankment with 3 ft top width and approximately 10:1 side slopes. The average height is approximately 3.0 ft and average volume is 3.67CY/ft. Outlet is typically an underground outlet. An earthen embankment is constructed across the slope and minor watercourses to form a sediment trap and water detention basin. Work is done with dozer, scraper, or road grader. Costs include all equipment necessary to excavate, shape, grade and compact the Water and Sediment Control Basin and mobilization of equipment. This practice is utilized to reduce watercourse and gully erosion, trap sediment, reduce and manage onsite and downstream runoff. Sheet and rill erosion will be controlled by other conservation practices. Height is measured on centerline at low point.

Before Situation:

Farming fields with excessive slope length has resulted in multiple rills and/or ephemeral gullies that will continue to worsen over time. The excessive erosion may lead to deterioration of receiving waters due to excessive sedimentation and nutrient transport. Resource concern addressed includes soil erosion and water quality by trapping sediment and/or reduce erosion in a field to protect riparian areas and water bodies from sediment deposition. Surface water causes erosion and the sediment (and potentially pesticides) to be transported into the riparian areas and water bodies downstream.

After Situation:

Water and Sediment Control Basis is constructed with an average of 3.67CY/ft of earthfill per lineal foot with dozer, scraper and/or road grader. Rill and/or gully erosion is reduced. If riser and underground outlet are needed, then include Underground Outlet (620). Include Critical Area Planting (342) where necessary to prevent erosion following construction activities. Associated Practices: Critical Area Planting (342), Stormwater Runoff Control (570), and Underground Outlet (620)

Feature Measure: Lineal Feet

Scenario Unit: Feet

Scenario Typical Size: 450.00

Scenario Total Cost: $7,387.15

Scenario Cost/Unit: $16.42

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	1651.5	$6,622.52
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 638 - Water and Sediment Control Basin

Scenario: #3 - Berm between 4 feet and 6 feet tall, grassed

Scenario Description:

Typical scenario s for the construction of 3 basins, each with 200 lineal feet of earthen embankment with 3 ft top width and approximately 3:1 side slopes. The average height is approximately 3.7 ft and average volume is 1.93 CY/ft. Outlet is typically an underground outlet. An earthen embankment is constructed across the slope and minor watercourses to form a sediment trap and water detention basin. Work is done with dozer, scraper, or road grader. Costs include all equipment necessary to excavate, shape, grade and compact the Water and Sediment Control Basin, establish permanent vegetation and mobilization of equipment. This practice is utilized to reduce watercourse and gully erosion, trap sediment, reduce and manage onsite and downstream runoff. Sheet and rill erosion will be controlled by other conservation practices. Height is measured on centerline at low point.

Before Situation:

Farming fields with excessive slope length has resulted in multiple rills and/or ephemeral gullies that will continue to worsen over time. The excessive erosion may lead to deterioration of receiving waters due to excessive sedimentation and nutrient transport. Resource concern addressed includes soil erosion and water quality by trapping sediment and/or reduce erosion in a field to protect riparian areas and water bodies from sediment deposition. Surface water causes erosion and the sediment (and potentially pesticides) to be transported into the riparian areas and water bodies downstream.

After Situation:

Water and Sediment Control Basis is constructed with an average of 1.93 CY of earthfill per lineal foot with dozer, scraper and/or road grader. Rill and/or gully erosion is reduced. If riser and underground outlet are needed, then include Underground Outlet (620). Include Critical Area Planting (342) where necessary to prevent erosion following construction activities. Associated Practices: Critical Area Planting (342), Stormwater Runoff Control (570), and Underground Outlet (620)

Feature Measure: Lineal Feet

Scenario Unit: Feet

Scenario Typical Size: 600.00

Scenario Total Cost: $5,544.64

Scenario Cost/Unit: $9.24

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	1158	$4,643.58
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	0.8	$11.90
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.61	0.4	$3.04
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	0.4	$8.91
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$10.18	0.4	$4.07
Materials						
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	24	$16.32
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.81	24	$19.44
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	24	$16.32
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$26.18	0.8	$20.94
Introduced Perennial Grasses, Legumes and/or Forbs, High Density	2749	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping.	Acres	$88.70	0.4	$35.48
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 638 - Water and Sediment Control Basin

Scenario: #4 - Berm between 4 feet and 6 feet tall, farmed

Scenario Description:

Typical scenario is for the construction of 3 basins, each with 200 lineal feet of earthen embankment with 3 ft top width and approximately 8:1 side slopes. The average height is approximately 4.47 CY/ft and average volume is 3.45 CY/ft. Outlet is typically an underground outlet. An earthen embankment is constructed across the slope and minor watercourses to form a sediment trap and water detention basin. Work is done with dozer, scraper, or road grader. Costs include all equipment necessary to excavate, shape, grade and compact the Water and Sediment Control Basin and mobilization of equipment. This practice is utilized to reduce watercourse and gully erosion, trap sediment, reduce and manage onsite and downstream runoff. Sheet and rill erosion will be controlled by other conservation practices. Height is measured on centerline at low point.

Before Situation:

Farming fields with excessive slope length has resulted in multiple rills and/or ephemeral gullies that will continue to worsen over time. The excessive erosion may lead to deterioration of receiving waters due to excessive sedimentation and nutrient transport. Resource concern addressed includes soil erosion and water quality by trapping sediment and/or reduce erosion in a field to protect riparian areas and water bodies from sediment deposition. Surface water causes erosion and the sediment (and potentially pesticides) to be transported into the riparian areas and water bodies downstream.

After Situation:

Water and Sediment Control Basin is constructed with an average of 4.47 CY/LF of earthfill per lineal foot with dozer, scraper and/or road grader. Rill and/or gully erosion is reduced. If riser and underground outlet are needed, then include Underground Outlet (620). Include Critical Area Planting (342) where necessary to prevent erosion following construction activities. Associated Practices: Critical Area Planting (342), Stormwater Runoff Control (570), and Underground Outlet (620)

Feature Measure: Lineal feet

Scenario Unit: Feet

Scenario Typical Size: 600.00

Scenario Total Cost: $11,519.45

Scenario Cost/Unit: $19.20

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	2682	$10,754.82
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 638 - Water and Sediment Control Basin

Scenario: #5 - Berm between 6 feet and 8 feet tall, grassed

Scenario Description:

Typical scenario s for the construction of 3 basins, each with 200 lineal feet of earthen embankment with 6 ft top width and approximately 3:1 side slopes. The average height is approximately 4.62 ft and average volume is 3.4 CY/ft. Outlet is typically an underground outlet. An earthen embankment is constructed across the slope and minor watercourses to form a sediment trap and water detention basin. Work is done with dozer, scraper, or road grader. Costs include all equipment necessary to excavate, shape, grade and compact the Water and Sediment Control Basin, establish permanent vegetation and mobilization of equipment. This practice is utilized to reduce watercourse and gully erosion, trap sediment, reduce and manage onsite and downstream runoff. Sheet and rill erosion will be controlled by other conservation practices. Height is measured on centerline at low point.

Before Situation:

Farming fields with excessive slope length has resulted in multiple rills and/or ephemeral gullies that will continue to worsen over time. The excessive erosion may lead to deterioration of receiving waters due to excessive sedimentation and nutrient transport. Resource concern addressed includes soil erosion and water quality by trapping sediment and/or reduce erosion in a field to protect riparian areas and water bodies from sediment deposition. Surface water causes erosion and the sediment (and potentially pesticides) to be transported into the riparian areas and water bodies downstream.

After Situation:

Water and Sediment Control Basis is constructed with an average of 3.4 CY of earthfill per lineal foot with dozer, scraper and/or road grader. Rill and/or gully erosion is reduced. If riser and underground outlet are needed, then include Underground Outlet (620). Include Critical Area Planting (342) where necessary to prevent erosion following construction activities. Associated Practices: Critical Area Planting (342), Stormwater Runoff Control (570), and Underground Outlet (620)

Feature Measure: Lineal feet

Scenario Unit: Feet

Scenario Typical Size: 600.00

Scenario Total Cost: $9,115.57

Scenario Cost/Unit: $15.19

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	2040	$8,180.40
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	1	$14.88
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.61	0.5	$3.81
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	0.5	$11.14
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$10.18	0.5	$5.09
Materials						
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	30	$20.40
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.81	30	$24.30
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	30	$20.40
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$26.18	1	$26.18
Introduced Perennial Grasses, Legumes and/or Forbs, High Density	2749	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping.	Acres	$88.70	0.5	$44.35
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 638 - Water and Sediment Control Basin

Scenario: #6 - Berm between 8 feet and 10 feet tall, grassed

Scenario Description:

Typical scenario s for the construction of 3 basins, each with 200 lineal feet of earthen embankment with 6 ft top width and approximately 3:1 side slopes. The average height is approximately 5.9 ft and average volume is 5.2 CY/ft. Outlet is typically an underground outlet. An earthen embankment is constructed across the slope and minor watercourses to form a sediment trap and water detention basin. Work is done with dozer, scraper, or road grader. Costs include all equipment necessary to excavate, shape, grade and compact the Water and Sediment Control Basin, establish permanent vegetation and mobilization of equipment. This practice is utilized to reduce watercourse and gully erosion, trap sediment, reduce and manage onsite and downstream runoff. Sheet and rill erosion will be controlled by other conservation practices. Height is measured on centerline at low point.

Before Situation:

Farming fields with excessive slope length has resulted in multiple rills and/or ephemeral gullies that will continue to worsen over time. The excessive erosion may lead to deterioration of receiving waters due to excessive sedimentation and nutrient transport. Resource concern addressed includes soil erosion and water quality by trapping sediment and/or reduce erosion in a field to protect riparian areas and water bodies from sediment deposition. Surface water causes erosion and the sediment (and potentially pesticides) to be transported into the riparian areas and water bodies downstream.

After Situation:

Water and Sediment Control Basis is constructed with an average of 5.2 CY of earthfill per lineal foot with dozer, scraper and/or road grader. Rill and/or gully erosion is reduced. If riser and underground outlet are needed, then include Underground Outlet (620). Include Critical Area Planting (342) where necessary to prevent erosion following construction activities. Associated Practices: Critical Area Planting (342), Stormwater Runoff Control (570), and Underground Outlet (620)

Feature Measure: Lineal feet

Scenario Unit: Feet

Scenario Typical Size: 600.00

Scenario Total Cost: $13,442.97

Scenario Cost/Unit: $22.40

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	3120	$12,511.20
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	1.2	$17.86
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.61	0.6	$4.57
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	0.6	$13.36
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$10.18	0.6	$6.11
Materials						
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	36	$24.48
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.81	36	$29.16
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	36	$24.48
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$26.18	1.2	$31.42
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$26.18	0.6	$15.71
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 638 - Water and Sediment Control Basin

Scenario: #7 - Berm between 10 feet and 12 feet tall, grassed

Scenario Description:

Typical scenario s for the construction of 2 basins, each with 250 lineal feet of earthen embankment with 8 ft top width and approximately 3:1 side slopes. The average height is approximately 7.3 ft and average volume is 8.0 CY/ft. Outlet is typically an underground outlet. An earthen embankment is constructed across the slope and minor watercourses to form a sediment trap and water detention basin. Work is done with dozer, scraper, or road grader. Costs include all equipment necessary to excavate, shape, grade and compact the Water and Sediment Control Basin, establish permanent vegetation and mobilization of equipment. This practice is utilized to reduce watercourse and gully erosion, trap sediment, reduce and manage onsite and downstream runoff. Sheet and rill erosion will be controlled by other conservation practices. Height is measured on centerline at low point.

Before Situation:

Farming fields with excessive slope length has resulted in multiple rills and/or ephemeral gullies that will continue to worsen over time. The excessive erosion may lead to deterioration of receiving waters due to excessive sedimentation and nutrient transport. Resource concern addressed includes soil erosion and water quality by trapping sediment and/or reduce erosion in a field to protect riparian areas and water bodies from sediment deposition. Surface water causes erosion and the sediment (and potentially pesticides) to be transported into the riparian areas and water bodies downstream.

After Situation:

Water and Sediment Control Basis is constructed with an average of 8 CY of earthfill per lineal foot with dozer, scraper and/or road grader. Rill and/or gully erosion is reduced. If riser and underground outlet are needed, then include Underground Outlet (620). Include Critical Area Planting (342) where necessary to prevent erosion following construction activities. Associated Practices: Critical Area Planting (342), Stormwater Runoff Control (570), and Underground Outlet (620)

Feature Measure: Lineal Feet

Scenario Unit: Feet

Scenario Typical Size: 500.00

Scenario Total Cost: $16,925.87

Scenario Cost/Unit: $33.85

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	4000	$16,040.00
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	1.2	$17.86
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.61	0.6	$4.57
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	0.6	$13.36
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$10.18	0.6	$6.11
Materials						
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	36	$24.48
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.81	36	$29.16
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	0.6	$0.41
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	36	$24.48
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	1.2	$0.82
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 638 - Water and Sediment Control Basin

Scenario: #8 - Berm between 12 feet and 15 feet tall, grassed

Scenario Description:

Typical scenario s for the construction of 1 basins, 250 lineal feet of earthen embankment with 8 ft top width and approximately 3:1 side slopes. The average height is approximately 8.9 ft and average volume is 11.5 CY/fts. Outlet is typically an underground outlet. An earthen embankment is constructed across the slope and minor watercourses to form a sediment trap and water detention basin. Work is done with dozer, scraper, or road grader. Costs include all equipment necessary to excavate, shape, grade and compact the Water and Sediment Control Basin, establish permanent vegetation and mobilization of equipment. This practice is utilized to reduce watercourse and gully erosion, trap sediment, reduce and manage onsite and downstream runoff. Sheet and rill erosion will be controlled by other conservation practices. Height is measured on centerline at low point.

Before Situation:

Farming fields with excessive slope length has resulted in multiple rills and/or ephemeral gullies that will continue to worsen over time. The excessive erosion may lead to deterioration of receiving waters due to excessive sedimentation and nutrient transport. Resource concern addressed includes soil erosion and water quality by trapping sediment and/or reduce erosion in a field to protect riparian areas and water bodies from sediment deposition. Surface water causes erosion and the sediment (and potentially pesticides) to be transported into the riparian areas and water bodies downstream.

After Situation:

Water and Sediment Control Basis is constructed with an average of 11.5 CY of earthfill per lineal foot with dozer, scraper and/or road grader. Rill and/or gully erosion is reduced. If riser and underground outlet are needed, then include Underground Outlet (620). Include Critical Area Planting (342) where necessary to prevent erosion following construction activities. Associated Practices: Critical Area Planting (342), Stormwater Runoff Control (570), and Underground Outlet (620)

Feature Measure: Lineal Foot

Scenario Unit: Feet

Scenario Typical Size: 250.00

Scenario Total Cost: $12,429.81

Scenario Cost/Unit: $49.72

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	2875	$11,528.75
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	0.8	$11.90
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.61	0.4	$3.04
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	0.4	$8.91
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$10.18	0.4	$4.07
Materials						
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	24	$16.32
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.81	24	$19.44
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	24	$16.32
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$26.18	0.8	$20.94
Introduced Perennial Grasses, Legumes and/or Forbs, High Density	2749	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping.	Acres	$88.70	0.4	$35.48
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 642 - Water Well

Scenario: #2 - Shallow (less than 75 ft)

Scenario Description:
Typical construction is for the installation of a well, in areas where sufficient water is known to occur within 50 feet of the ground surface. The well shall be drilled, driven, or bored (typically drilled) to an aquifer for water supply. The purpose of the practice is to provide water for livestock or irrigation. An average shallow well depth is 50 feet. Well casings are 4-6' in diameter. PVC casing is installed to a depth of 45 feet with a 5 ft screen.

Before Situation:
Livestock have insufficient water or are fenced from their water source. There is insufficient water for use in micro-irrigation.

After Situation:
Sufficient water is available for livestock or irrigation. Utilize Pumping Plant (533) and Pipeline (516) as associated practices. Use Critical Area Seeding (342) where necessary to prevent erosion following construciton activities.

Feature Measure: Depth of Well in Feet (from Well Lo

Scenario Unit: Feet

Scenario Typical Size: 50.00

Scenario Total Cost: $3,494.64

Scenario Cost/Unit: $69.89

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Rotary Drill Rig	1595	Rotary drill rig including equipment and power unit costs. Labor not included.	Hours	$353.09	4	$1,412.36
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	4	$114.84
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	4	$160.52
Materials						
Test, Standard Water Test, Well Water	309	Well Water Suitability test. Includes materials and shipping only.	Each	$53.50	1	$53.50
Grout, cement	1333	Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite gout mixtures. Includes materials, equipment and labor to place.	Cubic Yards	$763.61	0.5	$381.81
Chlorine	1335	Liquid chlorine bleach. Includes materials only.	Gallons	$6.95	1	$6.95
Well Cap, 4 in.	1785	Well cap, 4 inch. Materials only.	Each	$36.66	1	$36.66
Well Casing, Plastic, 4 in.	1803	PVC or ABS non-threaded well casing, 4 inch. Materials only.	Feet	$6.06	45	$272.70
Well Screen, plastic, 4 in.	1998	4 inch PVC well screen. Materials only.	Feet	$8.77	5	$43.85
Pitless Adapter Unit	2549	Attach pitless adapter unit to existing well casing. Includes materials only.	Each	$246.82	1	$246.82
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 642 - Water Well

Scenario: #3 - Typical (75 ft and deeper)

Scenario Description:
Typical construction is for the installation of a well, in areas where sufficient water is known to occur from 75 to 300 feet of the ground surface. The well shall be drilled to an aquifer for water supply. The purpose of the practice is to provide water for livestock or irrigation. An average well depth is 175 feet. Well casings are 4-6' in diameter. PVC casing is installed to a depth of 165 feet with a 10 ft screen. See well log for casing depth (length).

Before Situation:
Livestock have insufficient water or are fenced from their water source. There is insufficient water for use in micro-irrigation.

After Situation:
Sufficient water is available for livestock or micro-irrigation. An average well depth is 175 feet. Well casings are 4-6' in diameter. PVC casing is installed to a depth of 165 feet with a 10 ft screen. Utilize Pumping Plant (533) and Pipeline (516) as associated practices. Use Critical Area Seeding (342) where necessary to prevent erosion following construciton activities.

Feature Measure: Depth of Well in Feet (from Well Lo

Scenario Unit: Feet

Scenario Typical Size: 175.00

Scenario Total Cost: $10,269.41

Scenario Cost/Unit: $58.68

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Rotary Drill Rig	1595	Rotary drill rig including equipment and power unit costs. Labor not included.	Hours	$353.09	13	$4,590.17
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	13	$373.23
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	13	$521.69
Materials						
Test, Standard Water Test, Well Water	309	Well Water Suitability test. Includes materials and shipping only.	Each	$53.50	1	$53.50
Grout, cement	1333	Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite gout mixtures. Includes materials, equipment and labor to place.	Cubic Yards	$763.61	2	$1,527.22
Chlorine	1335	Liquid chlorine bleach. Includes materials only.	Gallons	$6.95	1	$6.95
Well Cap, 6 in.	1786	Well cap, 6 inch. Materials only.	Each	$58.35	1	$58.35
Well Casing, Plastic, 6 in.	1804	PVC or ABS non-threaded well casing, 6 inch. Materials only.	Feet	$11.65	165	$1,922.25
Well Screen, plastic, 6 in.	1999	6 inch PVC well screen. Materials only.	Feet	$20.46	10	$204.60
Pitless Adapter Unit	2549	Attach pitless adapter unit to existing well casing. Includes materials only.	Each	$246.82	1	$246.82
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 642 - Water Well

Scenario: #4 - High Volume

Scenario Description:
Typical construction is for the installation of a well, in areas where sufficient water is known to occur from 75 to 300 feet of the ground surface. The well shall be drilled to an aquifer for water supply. The purpose of the practice is to provide a high volume of water for irrigation, or aquaculture. An average well depth is 150 feet. Well casings are 10' in diameter. Steel casing is installed to a depth of 137 feet with a 13 ft screen. See well log for depth (length).

Before Situation:
There is insufficient water for use in irrigation or filling aquaculture ponds.

After Situation:
Sufficient water is available for irrigation or aquaculture. Utilize Pumping Plant (533) and Pipeline (516) and Aquaculture Pond (397) as associated practices. Use Critical Area Seeding (342) where necessary to prevent erosion following construciton activities.

Feature Measure: Depth of Well in Feet (from Well Lo

Scenario Unit: Feet

Scenario Typical Size: 150.00

Scenario Total Cost: $24,727.00

Scenario Cost/Unit: $164.85

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Rotary Drill Rig	1595	Rotary drill rig including equipment and power unit costs. Labor not included.	Hours	$353.09	19	$6,708.71
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	16	$459.36
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	19	$762.47
Materials						
Test, Standard Water Test, Well Water	309	Well Water Suitability test. Includes materials and shipping only.	Each	$53.50	1	$53.50
Grout, cement	1333	Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite gout mixtures. Includes materials, equipment and labor to place.	Cubic Yards	$763.61	2	$1,527.22
Chlorine	1335	Liquid chlorine bleach. Includes materials only.	Gallons	$6.95	1	$6.95
Well Cap, 12 in.	1789	Well cap, 12 inch. Materials only.	Each	$171.51	1	$171.51
Well Casing, Metal, 10 in.	1812	Steel well casing, 10 inch. Materials only.	Feet	$63.59	137	$8,711.83
Aquifer Flow Test	1817	High-volume aquifer flow test. Includes labor and equipment.	Hours	$186.02	1	$186.02
Well Screen, stainless steel, 10 in.	1996	10 inch Stainless steel well screen. Materials only.	Feet	$235.09	13	$3,056.17
Pitless Adaptor Unit, Flowing Well	2432	Weld on flowing well pitless adapter unit. Includes materials only.	Each	$1,454.26	1	$1,454.26
Reduced Pressure Zone Device	2486	Reduced pressure principal backflow prevention device (RPZ) is a type of backflow prevention device used to protect an aquifer or water supply from contamination. Includes materials only.	Each	$864.37	1	$864.37
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 642 - Water Well

Scenario: #138 - Dug Well

Scenario Description:
Typical construction is for the excavation of a shallow dug well. The purpose of the practice is to provide water for livestock. A typical dug well is 4 foot in diameter and 15 feet in depth. The well is excavated using a backhoe. Excavate to a depth where the water recharge is greater than the equipment can remove. Washed gravel is placed in the base of the dug opening. Concrete manhole risers are installed to hold the water. Pea gravel is placed above the washed gravel to transition to the earth backfill. The hole is backfilled and sloped to direct surface water away from entering the manhole cover.

Before Situation:
Livestock have insufficient water or are fenced from their water source.

After Situation:
Sufficient water is available for livestock. Utilize Pumping Plant (533) and Pipeline (516) as associated practices. Use Critical Area Seeding (342) where necessary to prevent erosion following construciton activities.

Feature Measure: No.

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $14,559.56

Scenario Cost/Unit: $14,559.56

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	10	$661.80
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	10	$287.10
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	11	$441.43
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	3	$91.08
Test, Standard Water Test, Well Water	309	Well Water Suitability test. Includes materials and shipping only.	Each	$53.50	1	$53.50
Manhole, 4 ft x 4 ft	1053	Precast Manhole with base and top delivered. 4 feet diameter x 4 feet. Includes materials only.	Each	$1,369.50	5	$6,847.50
Aggregate, gravel, washed, pea gravel	1331	Washed and graded pea gravel river stone. Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$32.50	1	$32.50
Grout, cement	1333	Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite gout mixtures. Includes materials, equipment and labor to place.	Cubic Yards	$763.61	7	$5,345.27
Chlorine	1335	Liquid chlorine bleach. Includes materials only.	Gallons	$6.95	5	$34.75
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 642 - Water Well

Scenario: #139 - Shallow Well

Scenario Description:
Typical construction is for the installation of a well, in areas where sufficient water is known to occur within 100 feet of the ground surface. The well shall be drilled, dug, driven, bored, jetted or otherwise constructed to an aquifer for water supply. The purpose of the practice is to provide water for livestock or irrigation. An average well depth is 75 feet. Well casings are 4-6' in diameter. Steel casing is installed to a depth of 50 feet.

Before Situation:
Livestock have insufficient water or are fenced from their water source. There is insufficient water for use in micro-irrigation.

After Situation:
Sufficient water is available for livestock or irrigation. Utilize Pumping Plant (533) and Pipeline (516) as associated practices. Use Critical Area Seeding (342) where necessary to prevent erosion following construciton activities.

Feature Measure: No.

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $10,231.80

Scenario Cost/Unit: $10,231.80

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Rotary Drill Rig	1595	Rotary drill rig including equipment and power unit costs. Labor not included.	Hours	$353.09	10	$3,530.90
Materials						
Test, Standard Water Test, Well Water	309	Well Water Suitability test. Includes materials and shipping only.	Each	$53.50	1	$53.50
Grout, cement	1333	Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite gout mixtures. Includes materials, equipment and labor to place.	Cubic Yards	$763.61	2	$1,527.22
Chlorine	1335	Liquid chlorine bleach. Includes materials only.	Gallons	$6.95	1	$6.95
Well Cap, 6 in.	1786	Well cap, 6 inch. Materials only.	Each	$58.35	1	$58.35
Well Casing, Metal, 6 in.	1810	Steel well casing, 6 inch. Materials only.	Feet	$31.20	50	$1,560.00
Well Screen, stainless steel, 6 in.	1995	6 inch Stainless steel well screen. Materials only.	Feet	$109.21	25	$2,730.25
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 642 - Water Well

Scenario: #140 - Typical Well

Scenario Description:
Typical construction is for the installation of a well, in areas where sufficient water is known to occur 100 - 600 feet of the ground surface. The well shall be drilled, dug, driven, bored, jetted or otherwise constructed to an aquifer for water supply. The purpose of the practice is to provide water for livestock or micro-irrigation. An average well depth is 400 feet. Well casings are 4-6' in diameter. Steel casing is installed to a depth of 300 feet.

Before Situation:
Livestock have insufficient water or are fenced from their water source. There is insufficient water for use in micro-irrigation.

After Situation:
Sufficient water is available for livestock or micro-irrigation. Utilize Pumping Plant (533) and Pipeline (516) as associated practices. Use Critical Area Seeding (342) where necessary to prevent erosion following construciton activities.

Feature Measure: No.

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $36,991.80

Scenario Cost/Unit: $36,991.80

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Rotary Drill Rig	1595	Rotary drill rig including equipment and power unit costs. Labor not included.	Hours	$353.09	40.5	$14,300.15
Materials						
Test, Standard Water Test, Well Water	309	Well Water Suitability test. Includes materials and shipping only.	Each	$53.50	1	$53.50
Grout, cement	1333	Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite gout mixtures. Includes materials, equipment and labor to place.	Cubic Yards	$763.61	2	$1,527.22
Chlorine	1335	Liquid chlorine bleach. Includes materials only.	Gallons	$6.95	1	$6.95
Well Cap, 6 in.	1786	Well cap, 6 inch. Materials only.	Each	$58.35	1	$58.35
Well Casing, Metal, 6 in.	1810	Steel well casing, 6 inch. Materials only.	Feet	$31.20	300	$9,360.00
Well Screen, stainless steel, 6 in.	1995	6 inch Stainless steel well screen. Materials only.	Feet	$109.21	100	$10,921.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 642 - Water Well

Scenario: #141 - Deep Well

Scenario Description:
Typical construction is for the installation of a well, in areas where sufficient water is known to occur > 600 feet of the ground surface. The well shall be drilled, dug, driven, bored, jetted or otherwise constructed to an aquifer for water supply. The purpose of the practice is to provide water for livestock or micro-irrigation. An average well depth is 800 feet. Well casings are 4-6' in diameter. Steel casing is installed to a depth of 600 feet.

Before Situation:
Livestock have insufficient water or are fenced from their water source. There is insufficient water for use in micro-irrigation.

After Situation:
Sufficient water is available for livestock or micro-irrigation. Utilize Pumping Plant (533) and Pipeline (516) as associated practices. Use Critical Area Seeding (342) where necessary to prevent erosion following construciton activities.

Feature Measure: No.

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $67,865.50

Scenario Cost/Unit: $67,865.50

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Rotary Drill Rig	1595	Rotary drill rig including equipment and power unit costs. Labor not included.	Hours	$353.09	70.5	$24,892.85
Materials						
Test, Standard Water Test, Well Water	309	Well Water Suitability test. Includes materials and shipping only.	Each	$53.50	1	$53.50
Grout, cement	1333	Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite gout mixtures. Includes materials, equipment and labor to place.	Cubic Yards	$763.61	2	$1,527.22
Chlorine	1335	Liquid chlorine bleach. Includes materials only.	Gallons	$6.95	1	$6.95
Well Cap, 6 in.	1786	Well cap, 6 inch. Materials only.	Each	$58.35	1	$58.35
Well Casing, Metal, 6 in.	1810	Steel well casing, 6 inch. Materials only.	Feet	$31.20	600	$18,720.00
Well Screen, stainless steel, 6 in.	1995	6 inch Stainless steel well screen. Materials only.	Feet	$109.21	200	$21,842.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 642 - Water Well

Scenario: #142 - High Volume Shallow Well

Scenario Description:
Typical construction is for the installation of a well, in areas where sufficient water is known to occur within 100 feet of the ground surface. The well shall be drilled, dug, driven, bored, jetted or otherwise constructed to an aquifer for water supply. The purpose of the practice is to provide water for overhead irrigation. An average well depth is 75 feet. Well casings are = 8' in diameter. Steel casing is installed to a depth of 50 feet.

Before Situation:
There is insufficient water for use in irrigation.

After Situation:
Sufficient water is available for livestock or micro-irrigation. Utilize Pumping Plant (533) and Pipeline (516) as associated practices. Use Critical Area Seeding (342) where necessary to prevent erosion following construciton activities.

Feature Measure: No.

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $15,236.55

Scenario Cost/Unit: $15,236.55

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Rotary Drill Rig	1595	Rotary drill rig including equipment and power unit costs. Labor not included.	Hours	$353.09	10.5	$3,707.45
Materials						
Test, Standard Water Test, Well Water	309	Well Water Suitability test. Includes materials and shipping only.	Each	$53.50	1	$53.50
Grout, cement	1333	Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite gout mixtures. Includes materials, equipment and labor to place.	Cubic Yards	$763.61	2	$1,527.22
Chlorine	1335	Liquid chlorine bleach. Includes materials only.	Gallons	$6.95	1	$6.95
Well Cap, 10 in.	1788	Well cap, 10 inch. Materials only.	Each	$120.05	1	$120.05
Well Casing, Metal, 10 in.	1812	Steel well casing, 10 inch. Materials only.	Feet	$63.59	50	$3,179.50
Well Screen, stainless steel, 10 in.	1996	10 inch Stainless steel well screen. Materials only.	Feet	$235.09	25	$5,877.25
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 642 - Water Well

Scenario: #143 - High Volume Typical Well

Scenario Description:
Typical construction is for the installation of a well, in areas where sufficient water is known to occur 100 - 600 feet of the ground surface. The well shall be drilled, dug, driven, bored, jetted or otherwise constructed to an aquifer for water supply. The purpose of the practice is to provide water for livestock or micro-irrigation. An average well depth is 400 feet. Well casings are = 8' in diameter. Steel casing is installed to a depth of 300 feet.

Before Situation:
There is insufficient water for use in irrigation.

After Situation:
Sufficient water is available for livestock or micro-irrigation. Utilize Pumping Plant (533) and Pipeline (516) as associated practices. Use Critical Area Seeding (342) where necessary to prevent erosion following construciton activities.

Feature Measure: No.

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $59,358.50

Scenario Cost/Unit: $59,358.50

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Rotary Drill Rig	1595	Rotary drill rig including equipment and power unit costs. Labor not included.	Hours	$353.09	40.5	$14,300.15
Materials						
Test, Standard Water Test, Well Water	309	Well Water Suitability test. Includes materials and shipping only.	Each	$53.50	1	$53.50
Grout, cement	1333	Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite gout mixtures. Includes materials, equipment and labor to place.	Cubic Yards	$763.61	2	$1,527.22
Chlorine	1335	Liquid chlorine bleach. Includes materials only.	Gallons	$6.95	1	$6.95
Well Cap, 10 in.	1788	Well cap, 10 inch. Materials only.	Each	$120.05	1	$120.05
Well Casing, Metal, 10 in.	1812	Steel well casing, 10 inch. Materials only.	Feet	$63.59	300	$19,077.00
Well Screen, stainless steel, 10 in.	1996	10 inch Stainless steel well screen. Materials only.	Feet	$235.09	100	$23,509.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 642 - Water Well

Scenario: #144 - High Volume Deep Well

Scenario Description:
Typical construction is for the installation of a well, in areas where sufficient water is known to occur > 600 feet of the ground surface. The well shall be drilled, dug, driven, bored, jetted or otherwise constructed to an aquifer for water supply. The purpose of the practice is to provide water for livestock or micro-irrigation. An average well depth is 400 feet. Well casings are = 8' in diameter. Steel casing is installed to a depth of 600 feet.

Before Situation:
There is insufficient water for use in irrigation.

After Situation:
Sufficient water is available for livestock or micro-irrigation. Utilize Pumping Plant (533) and Pipeline (516) as associated practices. Use Critical Area Seeding (342) where necessary to prevent erosion following construciton activities.

Feature Measure: No.

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $112,537.20

Scenario Cost/Unit: $112,537.20

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Rotary Drill Rig	1595	Rotary drill rig including equipment and power unit costs. Labor not included.	Hours	$353.09	70.5	$24,892.85
Materials						
Test, Standard Water Test, Well Water	309	Well Water Suitability test. Includes materials and shipping only.	Each	$53.50	1	$53.50
Grout, cement	1333	Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite gout mixtures. Includes materials, equipment and labor to place.	Cubic Yards	$763.61	2	$1,527.22
Chlorine	1335	Liquid chlorine bleach. Includes materials only.	Gallons	$6.95	1	$6.95
Well Cap, 10 in.	1788	Well cap, 10 inch. Materials only.	Each	$120.05	1	$120.05
Well Casing, Metal, 10 in.	1812	Steel well casing, 10 inch. Materials only.	Feet	$63.59	600	$38,154.00
Well Screen, stainless steel, 10 in.	1996	10 inch Stainless steel well screen. Materials only.	Feet	$235.09	200	$47,018.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 642 - Water Well

Scenario: #145 - Steel or Copper, 100 ft. or deeper

Scenario Description:
Typical construction is for the installation of a well, in areas where sufficient water is known to occur greater than 2000 feet from the ground surface. The well shall be drilled, dug, driven, bored, jetted or otherwise constructed to an aquifer for water supply. The purpose of the practice is to provide water for livestock or micro-irrigation. An average well depth is 2500 feet. Plastic Surface casings are 6 in diameter with smaller diameter casing and screen extending into the water bearing formation. Steel casing and screen is installed to a typical depth of 2500 feet.

Before Situation:
Livestock have insufficient water or are fenced from their water source. There is insufficient water for use in micro-irrigation.

After Situation:
Sufficient water is available for livestock or micro-irrigation. Utilize Pumping Plant (533) and Pipeline (516) as associated practices. Use Critical Area Seeding (342) where necessary to prevent erosion following construction activities.

Feature Measure: Depth of Well

Scenario Unit: Linear Feet

Scenario Typical Size: 2,000.00

Scenario Total Cost: $128,821.97

Scenario Cost/Unit: $64.41

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Rotary Drill Rig	1595	Rotary drill rig including equipment and power unit costs. Labor not included.	Hours	$353.09	120	$42,370.80
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	200	$5,742.00
Materials						
Test, Standard Water Test, Well Water	309	Well Water Suitability test. Includes materials and shipping only.	Each	$53.50	1	$53.50
Grout, cement	1333	Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite gout mixtures. Includes materials, equipment and labor to place.	Cubic Yards	$763.61	1	$763.61
Chlorine	1335	Liquid chlorine bleach. Includes materials only.	Gallons	$6.95	1	$6.95
Well Cap, 6 in.	1786	Well cap, 6 inch. Materials only.	Each	$58.35	1	$58.35
Well Casing, Stainless Steel/Copper, 2 in.	1796	Stainless steel or Copper well casing, 2 inch. Materials only.	Feet	$35.00	2000	$70,000.00
Well Casing, Plastic, 6 in.	1804	PVC or ABS non-threaded well casing, 6 inch. Materials only.	Feet	$11.65	500	$5,825.00
Well Screen, stainless steel, 2 in.	2278	2 inch Stainless steel well screen. Materials only.	Feet	$49.45	50	$2,472.50
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 643 - Restoration of Rare or Declining Natural Communities

Scenario: #1 - Restoring and Managing unique or diminishing native terrestrial and aquatic ecosystems

Scenario Description:

This scenario is for the management and monitoring of wildlife habitats that are considered uniuque, dwindling, or imperiled native plant communities. Includes inventory of site, restoration decisions, and actions to monitor the site. Other supporting or facilitating practices should be implemented to control undesirable species or to plant desirable species for restoration. An inventory and evaluation shall include the documentation of a pretreatment assessment of the targeted community with baseline data for comparision with post-treatment habitat conditions.

Before Situation:

A habitat assessment (using State Office approved habitat assessment method, protocol or tool) has indicated one or more habitat limiting factors under Inadequate Habitat for Fish or Wildlife, up to planning criteria. Habitat limiting factors include quality, quantity and continuity of forage, cover, shelter, space and water availability.

After Situation:

Habitat practices have been installed and are monitored to assure the identified deficient habitat limiting factors are up to planning criteria. Habitat limiting factors have been reduced, habitat data is being used to make managment decisions about installation of other practices or activites to restore rare and declining habitat. Structures that provide enhanced habitat for species of concern are monitored and maintained to facilitate the restoration of habitat.

Feature Measure: acre

Scenario Unit: Acres

Scenario Typical Size: 5.00

Scenario Total Cost: $607.50

Scenario Cost/Unit: $121.50

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	12.5	$607.50

Practice: 643 - Restoration of Rare or Declining Natural Communities

Scenario: #79 - Specialized Species on Cropland, with FI

Scenario Description:
On cropland, a resource concern has identified the need to re-establish, by planting of seed, a rare or declining plant community or community of local cultural importance. This practice scenario applies to areas in crop production. The restoration effort will consist of planting a mix of rich and diverse specialized of species that are native to the area and representative of the historic plant community. Seed for the specialized species are of limited supply (e.g. local genotypes), difficult to produce, or excessively difficult to harvest. Herbicide is applied, but no other seedbed preparation prior to seeding with the seed drill.

Before Situation:
Cropland suitable for the implementation of Restoration of Rare or Declining Communities (CPS 643).

After Situation:
Specialized species have been established, restoring the identified rare and declining community, or community of local cultural importance.

Feature Measure: acres

Scenario Unit: Acres

Scenario Typical Size: 10.00

Scenario Total Cost: $15,215.62

Scenario Cost/Unit: $1,521.56

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	10	$67.30
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	10	$222.70
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$415.54	10	$4,155.40
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	2	$97.20
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$12.66	10	$126.60
Native Perennial Grasses, Legumes and/or Forbs Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, limited species availability.	2618	Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a highly specialized mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed may have limited availability and be difficult to obtain, e.g. milkweed species. Restricted for use with Wildlife Habitat Planting (420) and Restoration of Rare or Declining Natural Communities (643). Includes materials and shipping.	Acres	$1,006.04	10	$10,060.40
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 643 - Restoration of Rare or Declining Natural Communities

Scenario: #80 - Specialized Species on Fallow or Non-Cropland, no FI

Scenario Description:

A resource concern has identified the need to re-establish, by planting of seed, a rare or declining plant community or community of local cultural importance. This practice scenario applies to areas not recently in crop production, including fallow cropland currently supporting native or non-native vegetation needing control prior to planting. The restoration effort will consist of planting a rich and diverse mix of species native to the area and representative of the historic plant community. Seed for the desired species are of limited supply (e.g. local genotypes), difficult to produce, or excessively difficult to harvest. Light site preparation will occur prior to planting via herbicide burndown, burning, mowing or disking. If the plant community supported difficult to control species; those species were treated previous to the planting via the implementation of CPS Brush Management (Code 314) and/or Herbaceous Weed Control (Code 315).

Before Situation:

The site supports a common plant community (not rare or declining) in the region and does not require aggressive techniques for control, making the site suitable establishment of the identified rare or declining community or community of local cultural importance.

After Situation:

Desired specialized species have been established, restoring the identified rare and declining community, or community of local cultural importance.

Feature Measure: acres

Scenario Unit: Acres

Scenario Typical Size: 10.00

Scenario Total Cost: $11,209.02

Scenario Cost/Unit: $1,120.90

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	10	$148.80
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	10	$67.30
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	10	$222.70
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	2	$97.20
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$12.66	10	$126.60
Native Perennial Grasses, Legumes and/or Forbs Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, limited species availability.	2618	Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a highly specialized mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed may have limited availability and be difficult to obtain, e.g. milkweed species. Restricted for use with Wildlife Habitat Planting (420) and Restoration of Rare or Declining Natural Communities (643). Includes materials and shipping.	Acres	$1,006.04	10	$10,060.40
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 643 - Restoration of Rare or Declining Natural Communities

Scenario: #81 - Habitat Monitoring and Management, Medium Intensity and Complexity

Scenario Description:
This scenario is applied to all landuse types including those with wildlife as a modifier, where any resource concern is identified related to rare or declining habitats, and where medium intensity and complexity of monitoring or management will treat the identified resource concern. Two or three monitoring efforts are needed and each requiring less than 2 people and less than 8 hours per effort. Two or three adaptive management efforts are required (such as cutting of limbs that impede monitoring efforts, replacing damaged fence markers, or other minor adaptive management activities). The adaptive mgmt requires hand labor and the occasional use of light equipment. A crew of 2 is needed for the hand labor efforts and the crew will require less than 16 total hours of labor per mgmt effort. Mowing of roads and trail is required to provide access for monitoring and management.

Before Situation:
Rare or declining habitat is deficient due to the absence of annual monitoring and adaptive management actions of medium intensity and complexity.

After Situation:
Rare or declining habitat is improved by implementation of annual adaptive management actions of medium intensity and complexity.

Feature Measure: Monitoring efforts and adaptive m

Scenario Unit: Acres

Scenario Typical Size: 160.00

Scenario Total Cost: $2,225.36

Scenario Cost/Unit: $13.91

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	4	$25.20
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	6	$152.16
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hours	$31.60	5	$158.00
Rangeland/grassland field monitoring kit	967	Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only.	Each	$49.50	1	$49.50
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	20	$574.20
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	5	$151.80
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	10	$1,114.50

Practice: 643 - Restoration of Rare or Declining Natural Communities

Scenario: #113 - Woodland-Oak Savanna Restoration, Light

Scenario Description:
Removing or reducing woody plant canopy through use of heavy equipment to promote herbaceous growth to restore and manage oak savannas where the Ecological Site Description indicates a savanna or prairie. Scenario is for oak savanna restoration where greater than 60% canopy cover across the treatment area is in non-herbaceous cover. Merchantable timber is logged commercially and the remaining woody material is removed. Payment is based on impacted acres only.

Before Situation:
The understory has a minimal amount of herbaceous and early woody successional vegetation. Wildlife food, cover and shelter are lacking and management is needed to create habitat for wildlife species that benefit from oak savannas

After Situation:
Savanna is restored and flora and fauna that depend on that habitat flourish.

Feature Measure: treated acres

Scenario Unit: Acres

Scenario Typical Size: 10.00

Scenario Total Cost: $3,727.49

Scenario Cost/Unit: $372.75

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$100.26	10	$1,002.60
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	40	$252.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	40	$1,148.40
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	10	$401.30
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 643 - Restoration of Rare or Declining Natural Communities

Scenario: #116 - Woodland-Oak Savanna Restoration, Heavy

Scenario Description:
Removing or reducing woody plant canopy through use of heavy equipment to promote herbaceous growth to restore and manage oak savannas where the Ecological Site Description indicates a savanna or prairie. Scenario is for oak savanna restoration where greater than 60% canopy cover across the treatment area is in non-herbaceous cover and the woody material to be removed has no commercial value. Payment is based on impacted acres only.

Before Situation:
The understory has a minimal amount of herbaceous and early woody successional vegetation. Wildlife food, cover and shelter are lacking and management is needed to create habitat for wildlife species that benefit from oak savannas

After Situation:
Savanna is restored and flora and fauna that depend on that habitat flourish.

Feature Measure: treated acres

Scenario Unit: Acres

Scenario Typical Size: 10.00

Scenario Total Cost: $9,238.89

Scenario Cost/Unit: $923.89

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	50	$315.00
Feller buncher	941	Equipment and power unit costs. Labor not included.	Hours	$148.46	20	$2,969.20
Log skidder	942	Equipment and power unit costs. Labor not included.	Hours	$61.64	20	$1,232.80
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	50	$2,193.50
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	40	$1,605.20
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 644 - Wetland Wildlife Habitat Management

Scenario: #2 - Habitat Monitoring and Management, Medium Intensity and Complexity

Scenario Description:

This scenario is applied to wetland areas located on all landuse types including those with wildlife as a modifier, where any resource concern is identified for wildlife, and where medium intensity and complexity of monitoring or management will treat the identified resource concern. Two or three monitoring efforts are needed and each requiring less than 2 people and less than 8 hours per effort. Two or three adaptive management efforts are required (such as cutting of limbs that are impeding access of birds into nest boxes, replacing damaged fence markers, cleaning of nest structures and debris around other structures). The adaptive mgmt requires hand labor and the occasional use of light equipment. A crew of 2 is needed for the hand labor efforts and the crew will require less than 16 total hours of labor per mgmt effort. Mowing of roads and trail is required to provide access for monitoring and management.

Before Situation:

Existing degraded plant conditions and resulting inadequate habitat for fish and wildlife have resulting in low use of the area by target and associated wetland wildlife species and wetland wildlife habitat is deficient due to the absence of annual monitoring and adaptive management actions of medium intensity and complexity. Existing landuse is planted to row crops (corn, soybeans,wheat) with the application of soil ammendments and pesticides and ground disturbing activities.

After Situation:

Based on the results of a State-approved upland wildlife habitat assessment process, the application of wetland wildlife habitat management efforts and prescribed monitoring have been implemented. With the application of this practice alone, or in combination with other supporting and facilitating practices, the issue of inadequate wetland wildlife habitat conditions are addressed as a result of monitoring and improved by implementation of annual adaptive management actions of medium intensity and complexity.

Feature Measure: Acres Managed and Monitored.

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $870.36

Scenario Cost/Unit: $8.70

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	6	$152.16
Rangeland/grassland field monitoring kit	967	Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only.	Each	$49.50	1	$49.50
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	6	$668.70

Practice: 644 - Wetland Wildlife Habitat Management

Scenario: #3 - Wild Rice Seeding

Scenario Description:

A Wild Rice bed established through hand seeding on an appropriate site. Typical practice size is 1 acre. Practice applicable on suitable wetland and open water habitats. It takes 2 people 4 hours to seed 1 acre of rice. One individual is needed to paddle the canoe while another broadcasts the seed. Mobilization takes two people two hours each to load canoe, drive to site and unload canoe. Landing sites are remote access.

Before Situation:

Wetland and open water habitats suitable to Wild Rice production that currently may support scattered individual wild rice plants, but does not support a Wild Rice bed. Care should be taken not to seed an area that has produced a crop in the past five years as a viable seed bank may exist. Currently wildlife habitat quality is low due to lack of native tall persistent emergent vegetation.

After Situation:

Desired condition is a restored rice bed. Rice beds provide good cover and brood rearing habitat for ducks, and is fed upon by muskrats, deer and other herbivores. Rice beds can be important nursery areas for young fish and amphibians, and they attract rails, red-winged blackbirds and other species of birds in the fall. This practice may help maintain wetland water quality by tying up nutrients, stabilizing loose soils, and forming a natural windbreak over shallow-water areas, preventing soil nutrients from being stirred into the water column. Wild rice also has significant historical and cultural values as such, the desired condition is one in which vigor is sufficient to justify harvest.

Feature Measure: Area planted

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $724.43

Scenario Cost/Unit: $724.43

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Materials						
Native Perennial Grasses, Legumes and/or Forbs, Low Density	2753	A mix of native perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Species typically easy to purchase. Includes material and shipping.	Acres	$190.81	1	$190.81
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 644 - Wetland Wildlife Habitat Management

Scenario: #4 - Management and Monitoring on Idled Cropland for Wetland Wildlife, foregone income - Level 1 (Year 2-5)

Scenario Description:

This scenario addresses wildlife habitat management for wetter or more water saturated portions of cropland fields which are valuable source of forage and cover for many waterfowl, shorebird and wading bird species. The cession of cropping and maintenance of hydrology will provide adequate forage and cover in areas where normal cropland production restricts the growth of cover and forage sources. Where this occurs on cropped fields, annual crops will be lost for one growing season (foregone income is included).

Before Situation:

Setting is any prairie pothole. The wetlands must be wholly or partially in cropland. These wetlands are currently cropped, and hydrology has or could be diverted from the wetland by way of tiling, field or road ditching, diking or any other feature that removes wetland hydrology. These wetter or more water saturated portions of cropland fields have the potential to produce a significant amount of moist soil plants which are valuable source of forage and cover for many waterfowl, shorebird and wading bird species. Under normal cropland production, the native vegetation is restricted on these sites through mechanical and/or chemical control. The current system provides little to no wildlife habitat with habitat limiting factors such as quality, quantity and continuity of forage, cover, shelter and space being identified. Drainage could also result in inadequate wildlife water and inadequate habitat.

After Situation:

The planning unit is adequately covered with permanent and/or annual (non-persistent) vegetation. The cession of cropping and maintenance of hydrology provides adequate forage and cover in areas where normal cropland production restricts the growth of cover and forage sources. Monitoring assures hydrology is intact and provides wildlife water and habitat. Acres will be assessed and score 0.5 or greater as both Wetlands and Cropland on the Wildlife Habitat Evaluation Guide. Monitoring will be used to determine if the hydrology remains intact and cover is adequate and free of invasive weed species. Examples of monitoring include but are not limited to: photo points with comparisons to surrounding wetlands, use documentation by livestock, regeneration or breeding success, completing an annual management records log, documenting wildlife sightings, documenting location and species of invasive plants and condition of vegetative and structural treatments.

Feature Measure: Area idled from crop production to

Scenario Unit: Acres

Scenario Typical Size: 2.00

Scenario Total Cost: $884.37

Scenario Cost/Unit: $442.19

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	1	$14.88
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$415.54	1	$415.54
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$342.50	1	$342.50
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	1	$111.45

Practice: 644 - Wetland Wildlife Habitat Management

Scenario: #5 - Idling Cropland for Wetland Wildlife - Level 2

Scenario Description:

This scenario addresses wildlife habitat management for wetter or more water saturated portions of cropland fields which are valuable source of forage and cover for many waterfowl, shorebird and wading bird species. The cession of cropping and maintenance of hydrology will provide adequate forage and cover in areas where normal cropland production restricts the growth of cover and forage sources. Where this occurs on cropped fields, annual crops will be lost for one growing season (foregone income is included).

Before Situation:

Setting is any wetland being 2 acres or less on the National Wetland Inventory with fully intact hydrology. The wetlands must be wholly or partially in cropland. These wetlands are currently cropped, and hydrology could be diverted from the wetland by way of tiling, field or road ditching, diking or any other feature that removes wetland hydrology. These wetter or more water saturated portions of cropland fields have the potential to produce a significant amount of moist soil plants which are valuable source of forage and cover for many waterfowl, shorebird and wading bird species. Under normal cropland production, the native vegetation is restricted on these sites through mechanical and/or chemical control. The current system provides little to no wildlife habitat with habitat limiting factors such as quality, quantity and continuity of forage, cover, shelter and space being identified. Drainage could also result in inadequate wildlife water and inadequate habitat.

After Situation:

The planning unit is adequately covered with annual (non-persistent) vegetation. The cession of cropping and maintenance of hydrology provides adequate forage and cover in areas where normal cropland production restricts the growth of cover and forage sources. Monitoring assures hydrology is intact and provides wildlife water and habitat. Acres will be assessed and score 0.5 or greater as both Wetlands and Cropland on the Wildlife Habitat Evaluation Guide. Monitoring will be used to determine if the hydrology remains intact and cover is adequate and free of invasive weed species. Examples of monitoring include but are not limited to: photo points with comparisons to surrounding wetlands, use documentation by livestock, regeneration or breeding success, completing an annual management records log, documenting wildlife sightings, documenting location and species of invasive plants and condition of vegetative and structural treatments.

Feature Measure: Area idled from crop production to

Scenario Unit: Acres

Scenario Typical Size: 2.00

Scenario Total Cost: $884.37

Scenario Cost/Unit: $442.19

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	1	$14.88
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$415.54	1	$415.54
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$342.50	1	$342.50
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	1	$111.45

Practice: 644 - Wetland Wildlife Habitat Management

Scenario: #6 - Monitoring and Management - Level 3

Scenario Description:

This scenario applies to cropped wetlands, two acres or less in size identified on the National Wetland Inventory, with intact hydrology, currently cropped (typically in a corn-wheat-soybean rotation) and lacking adequate food and cover for migratory water fowl during critical periods. The inadequate wildlife habitat resource concern can be addressed by allowing EXISTING annual vegetation (crops or other annual vegetation) to establish and persist during critical nesting and brood rearing seasons. Annual crops may be lost for one growing season.

Before Situation:

Existing habitat is a cropped wetland, lacking wildlife food and cover during the cropping season. Normal seeding and/or harvest occurs about 30% of the time. Excess wetness during the early planting season in the remaining years often cause ag producers to seed these small areas after the initial seeding date resulting in soil compaction, reduced hydrology, and limited crop success. As these areas are intermingled with upland, managing as a separate land use is unfeasible. Monitoring (with supporting photo documentation) and a State-approved Wildlife Habitat Evaluation Guide confirms an inadequate wildlife habitat resource concern exists.

After Situation:

Agricultural crop or annual vegetation will be allowed to persist providing food and cover essential for migratory birds. Crops and annual vegetation will not be harvested during the primary nesting season as identified by the habitat evaluation guide. This allows for successful nesting and brood rearing. The Wildlife Habitat Evaluation Guide documents an increase in planning criteria (and at a minimum meet planning criteria) for the inadequate wildlife habitat resource concern. Monitoring (with supporting photo documentation) demonstrates wildlife habitat has been improved to levels consistent with management goals/objectives, as well as observed use of the wetland habitat by wildlife.

Feature Measure: NWI for sizing

Scenario Unit: Acres

Scenario Typical Size: 2.00

Scenario Total Cost: $642.08

Scenario Cost/Unit: $321.04

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$415.54	0.7	$290.88
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$342.50	0.7	$239.75
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	1	$111.45

Practice: 645 - Upland Wildlife Habitat Management

Scenario: #4 - Habitat Monitoring and Management, High Intensity and Complexity, No Foregone Income

Scenario Description:

This scenario is applied to all landuse types including those with wildlife as a modifier, where any resource concern is identified for wildlife, and where high intensity and complexity of monitoring or management will treat the identified resource concern. Two - four monitoring efforts are needed and each requiring less than 2 people and less than 8 hours per effort. The adaptive management actions (2 - 5 efforts) such as cutting of limbs that are impeding access of birds into nest boxes, replacing damaged fence markers, cleaning of nest structures and debris around other structures requires hand labor and light equipment, requiring a 2-person crew less than 1 day per effort. The identified upland wildlife habitat limiting factors will be restored, enhanced or created, with the application of this practice alone, or in combination with other supporting and facilitating practices. Monitoring will be used to determine if the conservation system meets or exceeds the minimum quality criteria for the targeted wildlife. Upland wildlife habitat management and monitoring needed to treat the resource concerns may require training, no qualitative data assessment, no water quality monitoring and is medium in complexity and intensity. Examples of prescribed monitoring, include but are not limited to: photo points taken, use documentation by livestock, regeneration/breeding success, completing an annual management records log, documenting wildlife sightings, documenting location and species of invasive plants and condition of vegetative and structural treatments.

Before Situation:

Existing degraded plant conditions and resulting inadequate habitat for fish and wildlife have resulting in low use of the area by target and associated upland wildlife species. Existing landuse is planted to row crops (corn, soybeans, wheat) including crop management activities such as the addition of soil amendments, pesticide and ground disturbing activities.

After Situation:

Based on the results of a State-approved upland wildlife habitat assessment process, the application of upland wildlife habitat management efforts and prescribed monitoring have been implemented. With the application of this practice alone, or in combination with other supporting and facilitating practices, the inadequate upland wildlife habitat conditions are addressed, as a result of monitoring and implementation of adaptive mgmt activities.

Feature Measure: Acres Managed and Monitored

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $1,185.54

Scenario Cost/Unit: $11.86

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	6	$152.16
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	6	$108.78
Aerial Imagery	966	Aerial imagery. RBG (color), infrared or NDVI single image.	Acres	$1.77	100	$177.00
Rangeland/grassland field monitoring kit	967	Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only.	Each	$49.50	1	$49.50
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	6	$668.70
Materials						
Miscellaneous, containers, traps, etc.	298	Pheromone Traps, Culture container with lid. Includes materials and shipping only.	Each	$4.90	6	$29.40

Practice: 645 - Upland Wildlife Habitat Management

Scenario: #6 - Honeybee Habitat Multi Species Mix with Monitoring and Foregone Income

Scenario Description:

Setting is cropland with the potential to provide foraging habitat for European honey bees and the decision of the landuser is to forgo planting of corn, soybeans or wheat for this year to benefit the bee. Safe honey bee forage will be provided during the summer under this scenario. This scenario will include the planting of a multi-specie annual mixture for honey bee forage. Monitoring will be used to determine if the goal of providing safe forage for the honey bee is being met. Monitoring will involve measuring the use of different flowering species by honey bees and native pollinators, per NRCS monitoring guidelines.

Before Situation:

Corn, soybeans and wheat fields planted continuously or in rotation with other grain crops. Insects, fungi and flowering weeds are managed with the use of periodic application of pesticides, without regard to the honey bee. Minimal forage and cover habit is available to native pollinators and other wildlife.

After Situation:

In lieu of planting the area to grain, this area will be planted to a mixture of multi species annuals for honey bee forage this year. Application of pesticides will not be applied during the flowering season. These area will provide safe honey bee forage for a maximum period of time during the growing season, resulting in improved hive health and improved forage and cover habitat for associated wildlife. Monitoring data is used to assist in adaptive management decisions such as pesticide spraying timing and termination of planting following flowering to maximize benefits to the honeybee and minimize risks to the health of the bee associated with pesticide applications.

Feature Measure: Acres Managed and Monitored

Scenario Unit: Acres

Scenario Typical Size: 80.00

Scenario Total Cost: $36,720.43

Scenario Cost/Unit: $459.01

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	80	$1,781.60
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$415.54	26.7	$11,094.92
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$342.50	26.7	$9,144.75
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acres	$272.50	26.6	$7,248.50
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	38	$1,667.06
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	18	$874.80
Materials						
Annual Grasses, Legumes or Forbs	2732	A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$61.36	80	$4,908.80

Practice: 645 - Upland Wildlife Habitat Management

Scenario: #7 - Honeybee Monitoring

Scenario Description:

Setting is land with cover that has the potential to provide foraging habitat for European honey bees. Safe honey bee forage will be provided and managed throughout the summer. Monitoring will be used to determine if the goal of providing safe forage for the honey bee is being met. Monitoring will involve measuring the use of different flowering species by honey bees and native polinators, per NRCS monitoring guidelines.

Before Situation:

Insects, fungi and flowering weeds are managed with the use of periodic application of pesticides, without regard to the honey bee. Minimal forage and cover habit is available to native pollinators and other wildlife.

After Situation:

This area will be managed honey bee forage. Application of pesticides will not be applied during the flowering season. These area will provide safe honey bee forage for a maximum period of time during the growing season, resulting in improved hive health and improved forage and cover habitat for associated wildlife. Monitoring data is used to assist in adaptive management decisions such as pesticide spraying timing and termination of planting following flowering to maximize benefits to the honeybee and minimize risks to the health of the bee associated with pesticide applications.

Feature Measure: Acres Managed and Monitored

Scenario Unit: Acres

Scenario Typical Size: 80.00

Scenario Total Cost: $2,541.86

Scenario Cost/Unit: $31.77

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	38	$1,667.06
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	18	$874.80

Practice: 645 - Upland Wildlife Habitat Management

Scenario: #273 - Wildlife Habitat Enhancement

Scenario Description:
Exclusion of livestock on grassland for the enhancement of habitat for wildlife.

Before Situation:
Wildlife habitat is grazed during the primary nesting and development of wildlife species.

After Situation:
Livestock are excluded for wildlife habitat enhancement for the desired wildlife species. Implementation includes the exclusion of livestock to allow for adequate deferment for sufficient regrowth and developnet of the habitat.

Feature Measure: Acres Excluded

Scenario Unit: Acres

Scenario Typical Size: 80.00

Scenario Total Cost: $1,789.60

Scenario Cost/Unit: $22.37

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$19.94	80	$1,595.20
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	4	$194.40

Practice: 645 - Upland Wildlife Habitat Management

Scenario: #282 - Establishment of seasonal wildlife forage or cover on cropland, no FI

Scenario Description:

This typical scenario occurs on cropland. The habitat assessment identifed the need to provide seasonal forage or cover for target wildlife species or guild. This habitat need will be met through the establishment of annual food plants or cover plants by planting of seed. The typical scenario for seasonal forage or cover will be established outside of crop season, thus FI is not needed. Seedbed preparation (light tilliage) will be furthered by firming the seed bed by cultipacking the site. The only fertilizer need is N as this is cropland and P and K levels are sufficient. Cropland, so mobilization of equipment not needed.

Before Situation:

Cropland that fails to provided food or cover for target species at the proper location and season to meet the needs of wildlife.

After Situation:

The availability of high-quality seasonal forage or seasonal cover for the target wildlife species is provided. Target wildlife health is improved and populations are increased.

Feature Measure: acre

Scenario Unit: Acres

Scenario Typical Size: 10.00

Scenario Total Cost: $1,781.00

Scenario Cost/Unit: $178.10

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	10	$148.80
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.61	10	$76.10
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	10	$222.70
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$10.18	10	$101.80
Materials						
Nitrogen (N), Ammonium Sulfate	70	Price per pound of N supplied by Ammonium Sulfate. Price is not per pound of total product applied, no conversion is needed.	Pound	$1.03	600	$618.00
Annual Grasses, Legumes or Forbs	2732	A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$61.36	10	$613.60

Practice: 645 - Upland Wildlife Habitat Management

Scenario: #283 - Establishment of seasonal forage or cover for wildlife on cropland, with FI

Scenario Description:
The habitat assessment identified the need to provide seasonal forage or cover for target wildlife species or guild. This habitat needs will be met through the establishment of annuals by planting of seed. The typical scenario is for cropland. Seed bed preparation is limited to one light disking, furthered by firming the seed bed by cultipacking the site. The only fertilizer need is N as this is cropland and P and K levels are sufficient. These wildlife forages or seasonal cover will be be available for wildlife during the cropping seasion, and are in lieu of the cash crops typically planted on the field. Thus, income from the cash crop will be foregone for a year.

Before Situation:
Cropland does not provide forage or cover needed for wildlife during the season on dearth.

After Situation:
Annual wildlife forages are planted in lieu of a cash crop. Target wildlife health is improved and populations are increased.

Feature Measure: acre

Scenario Unit: Acres

Scenario Typical Size: 10.00

Scenario Total Cost: $5,469.40

Scenario Cost/Unit: $546.94

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	10	$148.80
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.61	10	$76.10
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	10	$222.70
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$415.54	5	$2,077.70
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$342.50	5	$1,712.50
Materials						
Nitrogen (N), Ammonium Sulfate	70	Price per pound of N supplied by Ammonium Sulfate. Price is not per pound of total product applied, no conversion is needed.	Pound	$1.03	600	$618.00
Annual Grasses, Legumes or Forbs	2732	A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$61.36	10	$613.60

Practice: 645 - Upland Wildlife Habitat Management

Scenario: #284 - Establishment of seasonal forage or cover for wildlife on non-cropland.

Scenario Description:
The habitat assessment identifies the need to provide seasonal forage or cover for target wildlife species or guild. This habitat need will be met through the establishment of annual plants by planting of seed. The typical scenario is that this activity will occur on herbaceous areas, not currently in cropland. Due to existing dense vegetation, these area will need to be mowed 2-3 weeks prior to disking (primarily disking), then followed by a light disking. Seed bed preparation will be furthered by firming the seed bed by cultipacking the site. Mixed fertilizer is required to establish planted wildlife seasonal forage or seasonal cover..

Before Situation:
The existing habitat has an excess of herbaceous perineal habitat, but is lacking high-quality seasonal forage, or the existing cover is too dense and cover conditions found in annual plant communities are absent.

After Situation:
The availability of high-quality seasonal forage, or cover condition common in annual plant communities is provided and target wildlife health and populations are increased.

Feature Measure: acre

Scenario Unit: Acres

Scenario Typical Size: 10.00

Scenario Total Cost: $3,556.70

Scenario Cost/Unit: $355.67

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hours	$31.60	3	$94.80
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	20	$297.60
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acres	$22.61	10	$226.10
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.61	10	$76.10
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	10	$222.70
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$10.18	10	$101.80
Materials						
Nitrogen (N), Ammonium Sulfate	70	Price per pound of N supplied by Ammonium Sulfate. Price is not per pound of total product applied, no conversion is needed.	Pound	$1.03	1000	$1,030.00
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.81	600	$486.00
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	600	$408.00
Annual Grasses, Legumes or Forbs	2732	A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$61.36	10	$613.60

Practice: 645 - Upland Wildlife Habitat Management

Scenario: #304 - Inter-seeding Milkweed for Monarch Habitat

Scenario Description:

Inter-seeding milkweed into an existing stand of vegetation that has sufficient nectar plant richness and distribution, but lacks reproductive habitat (milkweed). Existing vegetation will be treated with herbicides in strips. Drilling of milkweed will be into the herbicide treated strips. Typical practice size is variable depending on site, this scenario uses 1 ac as the typical size. In addition to providing monarch habitat, this practice scenario may also reduce sheet, rill, and wind erosion, improve soil quality, improve water quality, and improve air quality. The practice may also provide wildlife habitat. Practice applicable on cropland, odd areas, corners, etc.

Before Situation:

An open field that supports enough forb species richness, abundance and distribution to provide monarch nectaring habitat, but reproductive habitat (milkweed) is insufficient. These conditions fail to meet the minimum habitat requirements for monarchs per conservation practice standard 654 ??? Upland Wildlife Habitat Management. Application of the monarch WHEG finds the habitat rating to be poor or fair.

After Situation:

The 645 Implementation Requirements have been developed for the site and has been applied. Land covered with permanent monarch habitat including a mix of native grasses, and forbs. Application of the monarch WHEG finds the habitat quality rating to be good to excellent. Plants sown for monarch habitat may also provide cover for beneficial insects and wildlife.

Feature Measure: Area Planted

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $259.54

Scenario Cost/Unit: $259.54

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	1	$6.73
Mechanical weed control, Vegetation termination	957	Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs.	Acres	$27.07	1	$27.07
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	1	$22.27
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$12.66	1	$12.66
Native Perennial Grasses, Legumes and/or Forbs, Low Density	2753	A mix of native perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Species typically easy to purchase. Includes material and shipping.	Acres	$190.81	1	$190.81

Practice: 645 - Upland Wildlife Habitat Management

Scenario: #336 - Management of Mid-Successional Habitat Conditions

Scenario Description:

To mimic natural disturbance of fire/grazing and hoof action, when the current conditions are late successional conditions such as warm season grasses, where forb richness, distribution and/or abundance is lacking. The target wildlife habitat conditions are not early successional habitat, but rather are mid-successional or late successional with a rich forb component. Disking, or other efforts to temporarily reduce vigor of the grass component, will be applied to create conditions necessary to encourage or maintain the forb component within the herbaceous plant community.

Before Situation:

The current conditions is grass dominated community with low forb richness, distribution and/or abundance. The habitat conditions are not providing suitable habitat for identified species needing mid-successional habitat.

After Situation:

The plant community is shifted to mid-successional or late successional with a rich forb component and is providing quality habitat for target species.

Feature Measure: acre

Scenario Unit: Acres

Scenario Typical Size: 10.00

Scenario Total Cost: $594.00

Scenario Cost/Unit: $59.40

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acres	$22.61	10	$226.10
Mechanical weed control, Vegetation termination	957	Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs.	Acres	$27.07	10	$270.70
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	2	$97.20

Practice: 645 - Upland Wildlife Habitat Management

Scenario: #338 - Delayed Mowing on Hay Fields to Meet Life History Requirements

Scenario Description:

This scenario is applied on currently well-maintained hay fields (cropland) to protect field-nesting birds and other wildlife from mowing equipment and subsequent loss of cover. Maintained hay fields contain high quality forage grasses including orchard grass, timothy, and fescue. Some hay fields may also contain legumes, such as alfalfa or clover. Hay fields are mowed using a sickle bar or disc mower. When hay fields are mowed during critical seasons (e.g. primary nesting season), wildlife (e.g. birds, bees, and turtles) can be injured from mowing equipment or nests are exposed to predation. A wildlife habitat evaluation (WHEG) indicates that the timing and/or method of mowing is detrimental to the habitat for target species. This practice scenario involves delaying mowing to avoid those critical seasons. Examples include (1) delayed mowing until August 1 or (2) in suitable areas a 65-day delayed second cut following a first cut that occurs before the primary nesting season. When mowing is delayed the nutritional content and digestibility of forage is significantly reduced and often the crop loses most value as livestock feed resulting in a loss of income for the agricultural producer. Over time, this management strategy will degrade agricultural crop (hay) value of the plant community mildly to significantly. However, it will provide valuable food and cover for wildlife.

Before Situation:

The site is a productive hay field dominated by cool or warm season forage grasses. The producer receives income from harvesting and selling quality hay. Wildlife (e.g. birds, bees, and turtles) are injured or killed during mowing operations and cover habitat is removed during critical seasons.

After Situation:

A wildlife habitat evaluation (WHEG) indicates that habitat degradation is addressed by the altered timing and method of harvest. Wildlife injury is reduced, and suitable cover is maintained because mowing operations are delayed. The hay field vegetative species composition transforms resulting in a greater variety of species. This change creates more structural diversity and provides valuable cover and forage for wildlife. The delay in mowing operations results in a loss of forage production quantity and quality as the field transitions towards more perennial broad leaf plants that are less valuable for hay production. The agricultural producer incurs a loss in income due to the delayed harvest beyond what is optimum for the forage.

Feature Measure: acres

Scenario Unit: Acres

Scenario Typical Size: 10.00

Scenario Total Cost: $1,868.60

Scenario Cost/Unit: $186.86

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hours	$31.60	4	$126.40
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$36.34	4	$145.36
Foregone Income						
FI, Hay, General Grass	2122	General Grass Hay is Primary Land Use	Ton	$49.18	30	$1,475.40
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	4	$121.44

Practice: 645 - Upland Wildlife Habitat Management

Scenario: #342 - Habitat Monitoring and Management, High Intensity and Complexity

Scenario Description:
This scenario is applied to all landuse types including those with wildlife as a modifier, where any resource concern is identified for wildlife, and where high intensity and complexity of monitoring or management will treat the identified resource concern. Two - four monitoring efforts are needed and each requiring less than 2 people and less than 8 hours per effort. The adaptive management actions (2 - 5 efforts) such as cutting of limbs that are impeding access of birds into nest boxes, replacing damaged fence markers, cleaning of nest structures and debris around other structures requires hand labor and light equipment, requiring a 2-person crew less than 1 day per effort.

Before Situation:
Wildlife habitat is deficient due to the absence of annual monitoring and adaptive management actions of high intensity and complexity.

After Situation:
Wildlife habitat is improved by implementation of annual adaptive management actions of high intensity and complexity.

Feature Measure: Monitoring efforts and adaptive m

Scenario Unit: Acres

Scenario Typical Size: 80.00

Scenario Total Cost: $2,809.20

Scenario Cost/Unit: $35.12

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	4	$522.04
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	8	$50.40
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	6	$152.16
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hours	$31.60	3	$94.80
Rangeland/grassland field monitoring kit	967	Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only.	Each	$49.50	1	$49.50
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	20	$574.20
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	3	$91.08
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	4	$160.52
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	10	$1,114.50

Practice: 645 - Upland Wildlife Habitat Management

Scenario: #343 - Habitat Monitoring and Management, Medium Intensity and Complexity

Scenario Description:
This scenario is applied to all landuse types including those with wildlife as a modifier, where any resource concern is identified for wildlife, and where medium intensity and complexity of monitoring or management will treat the identified resource concern. Two or three monitoring efforts are needed and each requiring less than 2 people and less than 8 hours per effort. Two or three adaptive management efforts are required (such as cutting of limbs that are impeding access of birds into nest boxes, replacing damaged fence markers, cleaning of nest structures and debris around other structures). The adaptive mgmt requires hand labor and the occasional use of light equipment. A crew of 2 is needed for the hand labor efforts and the crew will require less than 16 total hours of labor per mgmt effort. Mowing of roads and trail is required to provide access for monitoring and management.

Before Situation:
Wildlife habitat is deficient due to the absence of annual monitoring and adaptive management actions of medium intensity and complexity.

After Situation:
Wildlife habitat is improved by implementation of annual adaptive management actions of medium intensity and complexity.

Feature Measure: Monitoring efforts and adaptive m

Scenario Unit: Acres

Scenario Typical Size: 160.00

Scenario Total Cost: $2,225.36

Scenario Cost/Unit: $13.91

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	4	$25.20
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	6	$152.16
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hours	$31.60	5	$158.00
Rangeland/grassland field monitoring kit	967	Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only.	Each	$49.50	1	$49.50
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	20	$574.20
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	5	$151.80
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	10	$1,114.50

Practice: 646 - Shallow Water Development and Management

Scenario: #5 - Shallow Water Management, High Level

Scenario Description:

This scenario addresses inadequate habitat for fish and wildlife on cropland. To facilitate practice code 643, 644, 645, or 395, seasonal shallow water is provided annually for target species by purchasing of water, lifting of such water, monitoring of the water quality, response by target plant community, use by target flora or fauna. Sites are flooded up to a depth of 18'with an average depth of 9'. Monitoring and adaptive management accomplished of existing water control structures is accomplished to meet very specific conditions needed to address previously identified degraded plant conditions or inadequate habitat for fish and/or wildlife. This high-level managmenet is applied to lands used for crop, pasture, hay, forests or wildlife lands where target flora and fauna have been identified as a primary concern. Loss of some level of crop, forage, hay or forest products may occur depending on site specific conditions.

Before Situation:

The site has existing infrastructure (reliable water source, dikes, water control structures, pumps, gates) to provide a reliable seasonal water source. The site is not subject to frequent natural flooding. The potential benefits to target fauna and flora is not being captured. The purchase of water, supply of water and intensive managment of season water, coupled with monitoring, adaptive managment from highly trained individuals will fully address the identifed degraded plant conditions and/or inadequate habitat for fish and/or wildlife.

After Situation:

A single or series of shallow water areas that are managed per standard and specification. Water levels are regulated to maintain temporary wildlife habitat. Timing and duration of flooding and de-watering is dependent on specific species requirements. Water is pumped into area to be flooded. Flooded sites vary from mudflats to water depths of 18' with an average depth of 9'. The hydrologic conditions of ponding and saturation (frequency, depth, duration, timing) provides optimum seasonal habitat for waterfowl, shorebirds, and other wildlife (amphibians, reptiles, mammals, invertebrates, etc.). If Dikes or Water Control Structures are not currently present on the fields planned to be flooded, these practices may be planned for the same fields and cost shared under Structure for Water Control (587) and Dike (356). If a natural water source (i.e. precipitation or flooding) is not available, Pumping Plant (533) may be cost shared to provide a water source. Depending on local conditions, other Conservation Practices may also be required.

Feature Measure: Acre of shallow water

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $366.90

Scenario Cost/Unit: $366.90

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.39	1	$116.39
Equipment Installation						
Water management, Flooding & dewatering	969	Includes equipment and power unit. Labor not included.	Acre Feet	$295.73	0.75	$221.80
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	1	$28.71

Practice: 647 - Early Successional Habitat Development-Mgt

Scenario: #1 - Mowing

Scenario Description:

This scenario address inadequate habitat for fish and wildlife where setting back succession by mowing incoming woody species will improve habitat for the target species. Mowing can be used to increase structural diversity by creating areas of shorter vegetation preferred by some species or certain life stages of species. This scenario can be used nationwide. The typical setting for this scenario is at the edge of crop fields, in pastures, at the edge of woodlands or brushy areas, and in odd areas such as pivot corners. Where the management of woody plants is require to create or maintain early successional habitat conservation practice 314 brush management or 666 forest stand improvement should be used. Where chemical control of weeds, including invasives, is required to reduce competition for the desired plant community conservation practice 315 herbaceous weed control should be used. Where the seedbank is inadequate for natural regeneration and seeding is required use conservation practice 327 Conservation Cover. Where the need is to create early successional habitat within or at the edge of woodland or forest use conservation practice 666 forest stand improvement to remove trees.

Before Situation:

The site is static or trending to later successional plant community. The disturbance regime to maintain an earlier successional plant community is lacking. Pastures are often monotypic, lacking in diversity. Competition for sunlight from dense grass stands prevents seedling establishment. Stands are often dense and inhibit the movements of young wildlife such as game bird chicks. Area lacks diversity in the height of vegetation.

After Situation:

Early successional habitat maintained. Mowing has provided more sun light for forb establishment. The heterogeneity of the habitat structure has been increased.

Feature Measure: <Unknown>

Scenario Unit: Acres

Scenario Typical Size: 10.00

Scenario Total Cost: $1,543.14

Scenario Cost/Unit: $154.31

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hours	$31.60	20	$632.00
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	20	$607.20
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 647 - Early Successional Habitat Development-Mgt

Scenario: #2 - Disking

Scenario Description:

This practice addresses inadequate wildlife habitat for species requiring early successional habitat. This scenario provides early successional habitat by setting back succession and manipulating species composition by disking vegetation and creating bare ground. The typical setting for this scenario is at the edge of crop fields, in pastures, and in odd areas such as pivot corners. This scenario is applicable nationwide. Where the management of woody plants is require to create or maintain early successional habitat conservation practice 314 brush management or 666 forest stand improvement should be used. Where chemical control of weeds, including invasives, is required to reduce competition for the desired plant community conservation practice 315 herbaceous weed control should be used. Where the seedbank is inadequate for natural regeneration and seeding is required, use conservation practice 327 Conservation Cover. Where the need is to create early successional habitat within or at the edge of woodland or forest use conservation practice 666 forest stand improvement to remove trees.

Before Situation:

The site is static or trending to higher successional plant species. The disturbance regeme to maintain a lower successional stage is lacking. Pastures are often monotypic, lacking in diversity. Bare ground for seedling establishment is absent. Stands are often dense and inhibit the movements of younger wildlife species suchh as game bird chicks.

After Situation:

The application of this scenario improves wildlife habitat for species requiring early successional plant communities by reducing competition and creating bare ground for the establishment of early successional plants. Additionally, brood rearing habitat is improved both by the resultant food resources and the increased openess of the plant community that allows chicks to negotiate the terrain and exploit those food resources.

Feature Measure: width and length of treated area

Scenario Unit: Acres

Scenario Typical Size: 2.00

Scenario Total Cost: $349.16

Scenario Cost/Unit: $174.58

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acres	$22.61	2	$45.22
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 647 - Early Successional Habitat Development-Mgt

Scenario: #3 - Regeneration of mature alder stands.

Scenario Description:
Mow strips 100-200 feet wide with bobcat fitted fecon head (or similar equipment) within a larger management unit, perpendicular to water courses and wetland boundaries in order to create dense stands of young alders and other successional plant species with greater wildlife value. Management units should be approximately 1-5 acres in size and be comprised of five strips. One strip is mowed every five years resulting in a 20 year rotations within the management unit. The size of these strip cuts typically ranges from .50 acres to 3.50 acres. Create significantly improved habitat for target species, particularly American woodcock and ruffed grouse. Also benefit many neotropical migrants (e.g. golden winged warbler) and many other species of wildlife that require successional habitats. This practice can be used throughout the UP and probably also in the northern third of the lower peninsula in Michigan and it the northern areas of Wisconsin and Minnesota. Woody vegetation is dropped into the site and not removed except for possibly some firewood usage by the landowner. The alders should be the dormant season from November through mid March.

Before Situation:
Site has lack of habitat for target species that require successional habitats. The site is static or trending to later successional plant community. The disturbance regime to maintain an earlier successional plant community is lacking.

After Situation:
Site has strips cleared and regeneration creates significantly improved habitat for target species, particularly American woodcock and ruffed grouse. Also benefit many neotropical migrants (e.g. golden winged warbler) and many other species of wildlife that require successional habitats. This practice can be used throughout the UP and probably also in the northern third of the lower peninsula in Michigan and it the northern areas of Wisconsin and Minnesota. Woody vegetation is dropped into the site and not removed. The alders should be the dormant season from November through mid March.

Feature Measure: <Unknown>

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $819.32

Scenario Cost/Unit: $819.32

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Mechanical cutter, chopper	943	Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included.	Hours	$116.89	3.5	$409.12
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	3.5	$106.26
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 647 - Early Successional Habitat Development-Mgt

Scenario: #4 - Regeneration of aspen stands.

Scenario Description:

Mow strips 100-200 feet wide with bobcat fitted fecon head (or similar equipment) within a larger management unit, perpendicular to water courses and wetland boundaries in order to create dense stands of young aspen and other successional plant species with greater wildlife value. Management units should be approximately 1-5 acres in size and be comprised of five strips. One strip is mowed every five years resulting in a 20 year rotations within the management unit. The size of these strip cuts typically ranges from .5 acres to 3.5 acres. Create significantly improved habitat for target species, particularly American woodcock and ruffed grouse. Also benefit many neotropical migrants (e.g. golden winged warbler) and many other species of wildlife that require successional habitats. This practice can be used throughout the UP and probably also in the northern third of the lower peninsula in Michigan and northern areas in Wisconsin and Minnesota. Woody vegetation is dropped into the site and not removed. The aspen should be the dormant season from November through mid March.

Before Situation:

Site has lack of habitat for target species that require successional habitats. The site is static or trending to later successional plant community. The disturbance regime to maintain an earlier successional plant community is lacking.

After Situation:

Create significantly improved habitat for target species, particularly American woodcock and ruffed grouse. Also benefit many neotropical migrants (e.g. golden winged warbler) and many other species of wildlife that require successional habitats. This practice can be used throughout the UP and probably also in the northern third of the lower peninsula in Michigan and northern areas in Wisconsin and Minnesota. Woody vegetation is dropped into the site and not removed. The aspen should be the dormant season from November through mid March.

Feature Measure: <Unknown>

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $819.32

Scenario Cost/Unit: $819.32

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Mechanical cutter, chopper	943	Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included.	Hours	$116.89	3.5	$409.12
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	3.5	$106.26
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 647 - Early Successional Habitat Development-Mgt

Scenario: #15 - Woody Vegetation Removal-Mechanical

Scenario Description:

Removal of large woody vegetation of medium infestations on gentle sloping to moderately deep to deep soils. The practice entails the removal of brush by pushing, grubbing, masticating, chaining and then raking or piling in order to reduce fuel loading and improve ecological site condition. Brush density has exceeded desired levels based on ecological site potential. It has been determined that the brush is at the medium infestation. Typical unit is 20 acres.

Before Situation:

Area consist of excessive stands of shrub species degrading health and vigor of native herbaceous species promoting noxious and invasive species and degrading wildlife habitat.

After Situation:

Woody species are removed to achieve the desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and improved wildlife habitat.

Feature Measure: Acres Planned

Scenario Unit: Acres

Scenario Typical Size: 20.00

Scenario Total Cost: $8,504.07

Scenario Cost/Unit: $425.20

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 200 HP	928	Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included.	Hours	$182.87	33	$6,034.71
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	3	$76.08
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	33	$1,324.29
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	3	$145.80
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 647 - Early Successional Habitat Development-Mgt

Scenario: #16 - Edge Feathering (Cutback Borders)

Scenario Description:

Edge feathering involves cutting overstory trees within a 30-50' zone along the edge of forestland using hand tools such as chainsaws. The goal is to create a transitional zone between later successional stages like mature forest and very early successional stages like open fields. The forest overstory is removing allowing more sunlight deeper into the forest edge, which releases shade-intolerant trees and shrubs that can provide optimal food (increased soft mast and browse) and cover (high stem density, down woody debris) for numerous life stages of early successional target wildlife. A professional wildlife biologist will delineate edge feathering areas so that they extend at least 30 feet into the edge to reduce predation, but width of the feathered area can vary. Leave trees or shrubs of special wildlife benefit, such as dogwoods, viburnums, serviceberry, etc. Leaving cut slash and debris within the cutback area provides additional wildlife cover. Edge feathering along a given forest edge can occur at different times (years) to provide diversity in stages of growth. Herbicides may be used to control regeneration of undesirable species. Resource concerns within this zone include: Inadequate structure and composition and habitat degradation. Felling trees with chainsaws should occur from November 15th through March 31st to minimize disturbance to nesting wildlife, including golden winged warblers.

Before Situation:

There is a 'hard edge' (high contrast) between a closed-canopy forest with very little mid/understory herbaceous vegetation and an adjacent open field with very little woody cover. Little to no transitional habitat occurs between the two habitat types, hindering movement of species that utilize portions of both habitats. Few shade-intolerant, soft mast producing shrubs are present along the forest edge.

After Situation:

A transitional area of young trees, shrubs, briars, vines, and herbaceous species is established along and at least 30 feet into a forest edge because the existing tree canopy was removed allowing full sunlight to reach the ground. The feathered edge/cutback border provides stategically located habitat diversity, which benefits a variety of wildlife. Within this feathered edge, succession progresses from mostly seedlings and herbaceous plants, to briars and saplings, to pole-sized stages, to eventual canopy closure in 15-20 years. Woody stem density will increase until the canopy closes, providing previously unavailable cover for reproduction, foraging, and escape used by a variety of game and non-game wildlife. Different species utilize the various stages of succession, and some use the entire continuum. The early successional benefit is extended if additional/adjacent areas are treated in subsequent years, or if the same areas are treated again before canopy closure.

Feature Measure: width and length of treated area

Scenario Unit: Acres

Scenario Typical Size: 2.00

Scenario Total Cost: $1,328.64

Scenario Cost/Unit: $664.32

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	16	$100.80
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	1	$25.36
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	8	$350.96
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	17	$826.20
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$12.66	2	$25.32

Practice: 647 - Early Successional Habitat Development-Mgt

Scenario: #27 - Early Successional Habitat Forest Opening (Clearcut)

Scenario Description:

Early successional habitat (ESH) openings involve creating 2-acre clearcut patches in closed-canopy or degraded stands using hand tools such as chainsaws. The goal is to provide openings of early successional habitat within a matrix of later successional, more mature forested habitat. Resource concerns include: Undesirable plant productivity and health, Inadequate structure and composition, and habitat degradation. ESH openings within central hardwood stands progress from sapling to pole-timber sized trees, and the range of successional stages has the potential to provide optimal food (increased soft mast and browse) and cover (high stem density, down woody debris) for several years, which benefits the numerous life stages of early successional target wildlife. A professional wildlife biologist will delineate ESH openings at least 2 acres or greater in size. Location of wildlife openings can be adjusted to avoid steep slopes, riparian zones, and other environmentally sensitive areas, but can be located in xeric to mesic conditions. Tree tops can be removed to provide optimal conditions for tree and shrub regeneration, or left in place to deter deer browse while still providing open-canopy conditions that promotes early succession. To ensure a diversity of successional stages and maintain the overall forest habitat matrix, ESH openings should not exceed 25% of total forestland acreage per stand or tract, as determined by a professional wildlife biologist.

Before Situation:

The existing stand is closed-canopy with very little understory vegetation (tree reproduction or herbaceous species). The stand likely has been degraded in value by past harvesting practices so that the level of acceptable growing stock is too low to justify managing for timber production in its present condition, and/or the landowner's primary concern is not timber but maximizing the abundance and diversity wildlife using the stand.

After Situation:

A new, young stand of desirable trees, shrubs, briars, vines, and herbaceous species is established within the ESH opening because the existing tree canopy is removed allowing full sunlight to reach the ground. The ESH opening provides diversity within the overall forested habitat matrix, which diversifies habitat conditions to benefit a variety of wildlife. Within this ESH opening, succession progresses from mostly seedlings and herbaceous plants, to briars and saplings, to pole-sized stages, to eventual canopy closure in 15-20 years. Woody stem density will increase until the canopy closes, providing previously unavailable cover for reproduction, foraging, and escape used by a variety of game and non-game wildlife. Different species utilize the various stages of succession, and some use the entire continuum.

Feature Measure: width and length of treated area

Scenario Unit: Acres

Scenario Typical Size: 2.00

Scenario Total Cost: $1,398.64

Scenario Cost/Unit: $699.32

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	28	$176.40
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	4	$101.44
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	28	$803.88
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	6	$291.60
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$12.66	2	$25.32

Practice: 649 - Structures for Wildlife

Scenario: #1 - Loon Nesting Platform

Scenario Description:

This scenario is for the installation of Loon nesting platforms that are not covered under 643 and are needed when a habitat assessment indicates Inadequate Habitat for Common loons. Intensity is the number of structures to be installed per body of water which will be determined by the habitat assessment. The platform is 5'x6'x2' totalling 60 board feet of treated lumber. Construction requires 5 hours of skilled carpentry type labor to build the platform. Mobilization of skilled labor is two people for one hour each to transport the platform by boat or canoe to installation site.

Before Situation:

A habitat assessment has indicated a need for Loon nesting plaforms to bring one or more habitat limiting factors under inadequate habitat for wildlife up to planning criteria. Habitat limiting factors include shelter and nesting availability.

After Situation:

Installation of Loon Nesting Platforms will bring the identified deficient habitat up to planning criteria. The practice is installed using skilled labor without supervision and use of common hand tools and small equipment.

Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $612.31

Scenario Cost/Unit: $612.31

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	7	$200.97
Materials						
Dimension Lumber, Treated	1044	Treated dimension lumber with nominal thickness equal or less than 2 inches. Includes lumber and fasteners	Board Feet	$1.79	60	$107.40
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 649 - Structures for Wildlife

Scenario: #3 - Osprey Nesting Platform

Scenario Description:

This scenario is for the installation of wildlife nesting platforms that are not covered under 643 and are needed when a habitat assessment indicates Inadequate Habitat for Osprey. Intensity is the number of structures to be installed per body of water which will be determined by the habitat assesment. For this scenario the all materials, labor and equipment associated with the construction and deployment of the osprey nesting platform are combined into one cost component. The height of the osprey platform is 25 feet.

Before Situation:

A habitat assessment has indicated a need for osprey nesting platforms to bring one or more habitat limiting factors under inadequate habitat for wildlife up to planning criteria. The availability of suitable nesting sites are a habitat limiting factor for Osprey.

After Situation:

Installation of osprey nesting platform will bring the identified deficient habitat up to planning criteria. The practice is installed using both general labor with minimal supervision and skilled labor without supervision with use of common hand tools and medium size equipment.

Feature Measure: Foot

Scenario Unit: Feet

Scenario Typical Size: 25.00

Scenario Total Cost: $1,052.83

Scenario Cost/Unit: $42.11

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Pole, Utility, Nesting Platform	2048	Fabrication and installation of avian nesting platform. Includes all equipment, labor and material needed to install utility pole with a nesting platform.	Feet	$34.83	25	$870.75
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08

Practice: 649 - Structures for Wildlife

Scenario: #5 - Woody Habitat, On Site

Scenario Description:
A habitat assessment (using State Office approved habitat assessment method, protocol or tool) has indicated a need for structural shallow water cover due to a lack of woody debris which is a limiting habitat for amphibians, reptiles and fish populations. It will take .5 hours of chainsaw and operator time to perform felling and delimbing of the tree. It will take two individuals two hours each of manual labor to position tree drop and perform activities involved in anchoring the tree drop.

Before Situation:
A habitat assessment (using State Office approved habitat assessment method, protocol or tool) has indicated a need for structural shallow water cover due to a lack of woody debris which is a limiting habitat for amphibians, reptiles and fish populations.

After Situation:
Materials on site. Installation of treelog/ drops will bring the identified deficient habitats up to a level which allows for a sustainable population of the targeted wetland species.

Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $136.99

Scenario Cost/Unit: $136.99

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	0.5	$3.15
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$36.34	0.5	$18.17
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	3.5	$100.49
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	0.5	$15.18

Practice: 649 - Structures for Wildlife

Scenario: #7 - Bat Boxes

Scenario Description:

This scenario is for the installation of bat houses on all land uses where the targeted species has been identified as Rare and Declining. Structures are of low intensity and low complexity, when habitat assessment indicates Inadequate Habitat for Fish or Wildlife-habitat degradation. Intensity if the number of structures to be installed per acre. Intensity is the number of structures to be installed per acre and will be determined by the habitat assessment. Bat houses for this scenario require a 8 foot treated post 5 inches in diameter for mounting of the box. Bat Boxes can be installed using general labor and it takes one hour per bat box to dig the post hole, install post and errect bat box. Mobilization time will total .25 hour to haul posts, boxes, hand tools to site.

Before Situation:

A habitat assessment (using State Office approved habitat assessment method, protocol or tool) has indicated a need for wildlife structures of low intensity with low complexity to bring one or more habitat limiting factors under Inadequate Habitat for Fish or Wildlife, up to planning criteria. Habitat limiting factors include quality, quantity and continuity of forage, cover, shelter, space and water availability. Less than 1 structure per acre is needed to bring the deficient habitat limiting factor up to planning criteria. The structures can be installed within a quarter mile of a drivable road and terrain is gentle to moderate. (consider all the fence markers as one structure)

After Situation:

Installation of wildlife structures bring the identified deficient habitat limiting factors up to planning criteria. The practice is installed using general labor with minimal supervision or skilled labor without supervision with use of common hand tools and small equipment;

Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $160.53

Scenario Cost/Unit: $160.53

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	1	$28.71
Materials						
Post, Wood, CCA treated, 6 in. x 8 ft.	12	Wood Post, End 6 inch dia. X 8 ft., CCA Treated. Includes materials and shipping only.	Each	$25.26	1	$25.26
Habitat Box, Bat	246	BAT-1 Bat House Single. Includes materials and shipping.	Each	$61.04	1	$61.04
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	0.25	$45.52

Practice: 649 - Structures for Wildlife

Scenario: #8 - Snake Hibernaculum

Scenario Description:

This scenario covers all habitats, that are not covered under 643, that need installation of snake hibernaculum's when a habitat assessment indicates inadequate habitat for reptiles. This scenario includes all structures in the wildlife Structures-low and medium scenarios but whose installation may require medium to high intensity with high complexity. Intensity is the number of structures to be installed per acre. It will take 4 hours of equipment and operator time to excavate the trench, place the rock , backfill, cover with soil and spread spoil. General labor will total 4 hours and includes time to place the geotextile, shovel soil and perform fine grading. It will take 1 hour for equipment mobilization to transport excavator to and from the construction site.

Before Situation:

A habitat assessment (using State Office approved habitat assessment method, protocol or tool) has indicated a need for wildlife structures of medium to high intensity with high complexity to bring one or more habitat limiting factors of inadequate habitat for snakes, up to planning criteria. Habitat limiting factors include quality, quantity and continuity of forage, cover, shelter and space.

After Situation:

Installation of snake hibernaculum bring the identified deficient habitat limiting factors up to planning criteria. Installation of snake hibernaculum requires skilled labor and general labor with supervision and the use of common hand tools to heavy equipment.

Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $1,950.03

Scenario Cost/Unit: $1,950.03

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	4	$264.72
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	4	$114.84
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	4	$121.44
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile. Includes materials, local delivery within 20 miles of quarry, and placement.	Cubic Yards	$136.88	5	$684.40
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 649 - Structures for Wildlife

Scenario: #48 - Brush Pile - Small

Scenario Description:
Small brush piles are created to provide shrubby/woody escape cover for wildlife. Pushing or cutting of select small trees and placement in selected locations to provide wildlife cover. Typical scenario of 10' x 20' area for structure covered by interlocking limbs of trees less than 12 inches in diameter.

Before Situation:
The existing habitat lacks escape, ground nesting and safe loafing cover.

After Situation:
Small brush piles provide needed escape, ground nesting and safe loafing cover for targeted wildlife species.

Feature Measure: brush piles

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $43.62

Scenario Cost/Unit: $43.62

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$56.88	0.5	$28.44
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	0.5	$15.18

Practice: 649 - Structures for Wildlife

Scenario: #49 - Brush Pile - Large

Scenario Description:
Downed tree structures are created to provide shrubby/woody escape cover for wildlife. Existing sod will be killed prior to placement of tree structures. Felling of select trees and placement in selected locations to provide wildlife cover. Typical scenario of 30' x 50' area for structure covered by interlocking limbs of trees at least 12' in diameter.

Before Situation:
The existing habitat lacks escape, ground nesting and safe loafing cover.

After Situation:
Large brush piles provide needed escape, ground nesting and safe loafing cover for targeted wildlife species.

Feature Measure: brush piles

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $179.67

Scenario Cost/Unit: $179.67

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$56.88	1	$56.88
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	1	$6.30
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	3	$86.13
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	1	$30.36

Practice: 649 - Structures for Wildlife

Scenario: #52 - Nesting Box or Raptor Perch, Large, with Pole

Scenario Description:
Constructing a nest box or rapture perch on a steel pole with a predator guard where needed. A structure is provided to support the nesting and rearing of larger targeted species such as woodducks, bats, barn owls or to provide needed perches or nesting structures for raptures. Addresses Resource Concern: Inadequate Cover/Shelter.

Before Situation:
The area lacks sufficient overall nesting sites to support viable populations of targeted species. Predator guards provide needed protection of target species during nesting and rearing.

After Situation:
The installation of pole mounted nesting and rearing boxes support the life-cycle needs of targeted species, such as bats and waterfowl.

Feature Measure: Number of structures

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $440.16

Scenario Cost/Unit: $440.16

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Concrete, CIP, formless, non reinforced	36	Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic Yards	$220.05	0.1	$22.01
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	0.5	$9.07
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	1.5	$43.07
Materials						
Pipe, steel, galvanized, threaded, 1 1/4 inch, schedule 40	256	Spec. A-53, includes coupling and clevis hanger assembly sized for covering, 10 ft. OC	Feet	$18.43	10	$184.30
Habitat Box, waterfowl	1449	Wood Duck Box, typically 24x11x12 inch with 4 inch wide oval entrance, single. Includes material and shipping only.	Each	$130.79	1	$130.79
Predator Guard	1461	Predator guards (i.e. stove pipes, cone, hole guard, etc.) for habitat boxes. Materials only. Includes material and shipping only.	Each	$50.93	1	$50.93

Practice: 649 - Structures for Wildlife

Scenario: #54 - Nesting Structure - Turtle

Scenario Description:
A structure is provided to support the nesting life stage for a variety of turtle species and protect eggs from predation. These structures are designed to meet targeted species biology and life history needs and is based off the National Park Service design. Wood Turtles are a Wisconsin threatened species proposed for federally listing as a threatened or endangered species. Conservation practices that provide habitat and nesting area are critical to maintaining Wood Turtle populations. Larger nesting areas (12x12 ft. nesting box) will likely dilute nest predation. Multiple turtles will use the site throughout the nesting period.

Before Situation:
The area lacks sufficient nesting sites to support viable turtle populations. A suitable location to install the structure is available

After Situation:
The installation of the nesting structure supports the life-cyle needs of target species. The structure ensures that the limiting factor of nest site availably and egg predation is addressed.

Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $3,942.62

Scenario Cost/Unit: $3,942.62

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$56.88	3	$170.64
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	20	$574.20
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	3	$91.08
Materials						
Post, Wood, CCA treated, 4 in x 8 ft	10	Wood Post, Line 4 inch X 8 foot, CCA Treated. Includes materials and shipping only.	Each	$13.92	9	$125.28
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	12	$346.32
Wire Mesh Screen, galvanized, 1/16 in	1229	Wire Mesh Screen, galvanized, 1/16 inch grid spacing. Materials only.	Square Feet	$4.09	225	$920.25
Dimension Lumber, untreated, rot resistant	1613	Untreated dimension lumber with nominal thickness equal or less than 2 inches, milled from a rot resistant species such as cedar. Includes lumber and fasteners. Does not include labor.	Board Feet	$3.98	193	$768.14
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 650 - Windbreak/Shelterbelt Renovation

Scenario: #2 - Thinning

Scenario Description:
Windbreak is thinned by hand w/chainsaw and cut stumps have herbicide applied to prevent undesirable sprouting.

Before Situation:
Windbreak functionality has impacted snow distribution patterns. Windbreak tree and/or shrub species are overly dense and do not provide the desired wind protection.

After Situation:
Integrity of windbreak restored, function and health improved.

Feature Measure: Length of Renovation

Scenario Unit: Feet

Scenario Typical Size: 1,000.00

Scenario Total Cost: $952.88

Scenario Cost/Unit: $0.95

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	10	$63.00
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$81.82	2	$163.64
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	10	$287.10
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	2	$222.90
Materials						
Herbicide, Triclopyor	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acres	$34.16	1	$34.16
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08

Practice: 650 - Windbreak/Shelterbelt Renovation

Scenario: #5 - Removal less than 8 inches DBH with Skidsteer

Scenario Description:
Windbreak renovation requires the removal of degraded or inappropriate trees or shrubs within a windbreak. This may include removal of entire rows, including stumps or roots, or selected trees/shrubs in order to prepare for the necessary planting of a replacement row within the windbreak, improve the health of the remaining rows, and/or allow for supplemental planting to expand the windbreak.

Before Situation:
Reduce wind impacts by renovating 1,000 foot windbreaks or shelterbelts using heavy equipment to remove selected trees with average DBH < 8 Inches. Typically trees and shrubs are cleared by a Skidsteer using a tree sheer or saw. All slash material from cutting and pruning is either scattered and crushed, piled and crushed, chipped or removed from the treatment area.

After Situation:
Integrity and function of windbreak restored.

Feature Measure: Length of Renovation

Scenario Unit: Feet

Scenario Typical Size: 1,000.00

Scenario Total Cost: $2,510.80

Scenario Cost/Unit: $2.51

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$56.88	8	$455.04
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	10	$303.60
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	2	$222.90
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 650 - Windbreak/Shelterbelt Renovation

Scenario: #6 - Removal 8 inches or more DBH with Dozer

Scenario Description:
Windbreak renovation requires the removal of overgrown, degraded or inappropriate trees or shrubs within a windbreak. This may include removal of entire rows, including stumps or roots, or selected trees/shrubs in order to prepare for the necessary planting of a replacement row within the windbreak, improve the health of the remaining rows, and/or allow for supplemental planting to expand the windbreak.

Before Situation:
Reduce wind impacts by renovating 1,000 foot windbreaks or shelterbelts using heavy equipment to remove selected trees with average DBH > 8 inches. Typically trees and shrubs are cleared by dozer (D-6 or equivalent) using a brush rake or blade. All slash material from cutting and pruning is either scattered and crushed, piled and crushed, chipped or removed from the treatment area.

After Situation:
Integrity and function of windbreak restored.

Feature Measure: Length of Renovation

Scenario Unit: Feet

Scenario Typical Size: 1,000.00

Scenario Total Cost: $3,193.32

Scenario Cost/Unit: $3.19

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 200 HP	928	Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included.	Hours	$182.87	10	$1,828.70
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	11	$441.43
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 650 - Windbreak/Shelterbelt Renovation

Scenario: #8 - Supplemental Plantings, Bare Root

Scenario Description:
Parts of the windbreak being renovated have died. Supplemental plantings of bare root trees/shrubs will improve the effectiveness and longevity of the windbreak.

Before Situation:
Dead trees/shrubs are inhibiting windbreak effectiveness. A windbreak/shelterbelt is expanded through the planting of bare root tree and shrub seedlings at a average spacing of 8' (shrubs 4'-6', deciduous/conifer trees 8'-12') within row and 15'-20' between rows. Planting is achieved through hand planting.

After Situation:
The integrity and function of the windbreak is restored.

Feature Measure: Area of Renovation

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $859.64

Scenario Cost/Unit: $859.64

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$12.51	3	$37.53
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	3	$86.13
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	2	$222.90
Materials						
Tree, Hardwood, Seedling, Small	1509	Bare root hardwood seedlings 6 to 18 inches tall; includes tropical containerized seedlings of 8 cubic inches or smaller. Includes materials and shipping only.	Each	$0.95	200	$190.00
Tree, Conifer, Seedling, Small	1512	Containerized conifer seedlings, 4 or 6 cubic inches; or bare root conifer seedlings 1+0 (one-year old seedlings grown in their original seedbed). Includes materials and shipping only.	Each	$0.94	150	$141.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08

Practice: 654 - Road/Trail/Landing Closure and Treatment

Scenario: #1 - Road or Trail Abandonment or Rehabilitation, Light

Scenario Description:

Reshaping a trail to natural conditions. This scenario includes using light equipment such as a backhoe for the installation of water control devices such as water bars, rolling dips, controlling access, use of woody residue and pulling drainages on 500 feet of road on 35% hill slopes and a moderate grade. Some light hand work may be needed to clear site for the equipment. Since not all segments of the road/trail system may require this level of treatment, this scenario applies only to those segments that are impacted.

Before Situation:

The legacy trail/roads are severely affecting wetland/riparian areas, slope stability, and water quality. The trail/roads can no longer serve it's intended use and is incapable of handling needed equipment and traffic. Alternative access is possible. Therefore abandonment and rehabilitation is the best way to address the resource concerns and problems that are being created.

After Situation:

Roads or trail systems are stabilized and in natural conditions and not impacting wetland/riparian areas or water quality.

Feature Measure: length

Scenario Unit: Feet

Scenario Typical Size: 500.00

Scenario Total Cost: $2,242.94

Scenario Cost/Unit: $4.49

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	6	$397.08
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$56.88	1	$56.88
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	3	$18.90
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	4	$72.52
Water Bars	1500	Installation of graded trail water controlling structures such as water bars, broad based dips for erosion control. Typical cross section is 1.5 feet high with 4:1 side slopes yielding about 0.33 CY/ft of length.	Feet	$3.10	85	$263.50
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	3	$86.13
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	6	$182.16
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	2	$97.20
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 654 - Road/Trail/Landing Closure and Treatment

Scenario: #2 - Road or Trail or Landing Closure and Treatment, less than 35 percent hillslope

Scenario Description:

The practice includes permanent road/trail/landing closure, treatment, or removal and to hydrologically reconnect the hillslope to applicable drainage networks. The treatment will prohibit future access. The typical scenario includes decommissioning a 500 ft of an 18-foot wide trail/road with a landing on 30% forest slopes, using heavy equipment such as a bulldozer or similar equipment (excavator or road grader with ripper) to re-shape and obliterate the road base and landings in order to re-establish native vegetation. It also includes restoring hydrology with the removal of culverts and drainage fills. Necessary erosion control measures such as water bars are installed. Some hand-work may be necessary to clear the site for the equipment. When completed, there is no additional maintenance with heavy equipment needed. Since not all segments of the road/trail system may require this level of treatment, this scenario applies only to those segments that are causing the resource concerns.

Before Situation:

The legacy trail/road is severely affecting wetlands, riparian areas, slope stability, water quality and possibly T&E species. The trail/road can no longer serve it's intended use and is incapable of handling needed equipment and traffic. Alternative access is possible. Therefore abandonment and site restoration are the best approaches to address the resource concerns and problems that are being created.

After Situation:

Access to roads, trails and landings is closed. The site is restored to a natural condition.

Feature Measure: length

Scenario Unit: Feet

Scenario Typical Size: 500.00

Scenario Total Cost: $3,998.07

Scenario Cost/Unit: $8.00

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	6	$469.80
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	3	$391.53
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	4	$25.20
Water Bars	1500	Installation of graded trail water controlling structures such as water bars, broad based dips for erosion control. Typical cross section is 1.5 feet high with 4:1 side slopes yielding about 0.33 CY/ft of length.	Feet	$3.10	225	$697.50
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	6	$240.78
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	2	$97.20
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	2	$1,846.38

Practice: 654 - Road/Trail/Landing Closure and Treatment

Scenario: #3 - Road or Trail or Landing Closure and Treatment, 35 percent or more hillslope

Scenario Description:

The practice includes permanent road/trail/landing closure and treatment, and the hydrologically reconnection of the hillslope to applicable drainage networks. The treatment will limit future access. The typical scenario includes decommissioning an earthen road with landings on forest slopes over 35%, using a bulldozer or other heavy equipment such as an excavator or road grader with ripper to re-shape and obliterate the road base and landings in order to re-establish native vegetation. It also includes restoring hydrology with the removal of culverts and drainage fills. Necessary erosion control measures such as water bars are installed. The steep slopes makes this scenario costly due to the increased time needed to apply the measures and the need for additional water control devices. Some hand-work may be necessary to clear the site for the equipment. Tree/Shrub Site Prep is not included. However, Tree/Shrub Planting is recommended. When completed, there is no additional maintenance with heavy equipment needed. Since not all segments of the road/trail system may require this level of treatment, this scenario applies only to those segments that are causing the resource concerns.

Before Situation:

The legacy trail/road is severely affecting wetlands, riparian areas, unstable slopes, water quality, and possibly T&E species. The trail/road can no longer serve it's intended use and is incapable of handling needed equipment and traffic. Alternative access was possible. Therefore abandonment and site restoration are the best approaches to address the resource concerns and problems that are being created.

After Situation:

Access to roads, trails and landings is closed. The site is restored to a natural condition.

Feature Measure: length

Scenario Unit: Feet

Scenario Typical Size: 500.00

Scenario Total Cost: $5,950.64

Scenario Cost/Unit: $11.90

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	8	$626.40
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hours	$145.01	6	$870.06
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	2	$12.60
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	8	$202.88
Water Bars	1500	Installation of graded trail water controlling structures such as water bars, broad based dips for erosion control. Typical cross section is 1.5 feet high with 4:1 side slopes yielding about 0.33 CY/ft of length.	Feet	$3.10	500	$1,550.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	8	$321.04
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	6	$291.60
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	2	$1,846.38

Practice: 655 - Forest Trails and Landings

Scenario: #2 - Trail and Landing Installation

Scenario Description:

Construction of forest trails and landings for the purpose of providing access to a gently sloping forested tract, Access will allow the application of other conservation practices, monitoring and the installation of silvicultural management activities. It is not, however, to be used if the installation is done as part of a commercial operation such as timber harvesting. In such a case, the Scenario 1 should be used. Installation will include removal of trees and brush as needed, a minimum amount of blading and soil disturbance, and the installing of water control measures such as water bars, broad-based dips, wing ditches, etc. It will not include measures more common to access roads such as gravelling or ditching. Installation will be supervised by a consultant forester, land manager, or other resource professional.

Before Situation:

Access to the tract is not available for occasional travel by the landowner or manager for the purposes of monitoring, installing conservation practices and/or the installation of silvicultural management activities. Improperly installed trails and landings will cause soil erosion and water quality problems.

After Situation:

A trail system is installed that provides access to the forested tract and does not cause excessive erosion or water quality concerns.

Feature Measure: Length of trail treated

Scenario Unit: Feet

Scenario Typical Size: 2,000.00

Scenario Total Cost: $3,683.01

Scenario Cost/Unit: $1.84

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	10	$783.00
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	8	$50.40
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	4	$101.44
Water Bars	1500	Installation of graded trail water controlling structures such as water bars, broad based dips for erosion control. Typical cross section is 1.5 feet high with 4:1 side slopes yielding about 0.33 CY/ft of length.	Feet	$3.10	225	$697.50
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	16	$459.36
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	4	$121.44
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	10	$401.30
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 655 - Forest Trails and Landings

Scenario: #3 - Trail Erosion Control without Vegetation, Slopes < 35%

Scenario Description:

Rehabilitation of existing forest access trail segments by addressing legacy resource issues for long-term use. Typically the trail is a single lane and seasonal requiring sustained erosion control measures installed by using heavy equipment such as dozers, graders, backhoes, and/or excavators. The purpose is to hydrologically disconnect the existing trail/landing system from streams and natural drainages. This scenario includes designing and installing measures such as cross drains, rock drains, relief drains, out sloping (or changing surface drainage), rolling dips and water bars and ditch outs as needed, and applies to only those segments of the trail system that have resource concerns requiring rehabilitation. Some hand work (chainsaw) will be needed to allow the use of the equipment. Installation will be supervised. Other practices such as Stream Crossing, and Critical Area Planting, Access Road, and Structure for Water Control can be adjacent/appurtenant but not part of this practice scenario. Treatments are for long-term reduction of sediment, restoration of fish habitat, creation of fire access, and the removal of routes off unstable slopes.

Before Situation:

Trails are delivering sediment to waterways, impacting riparian areas and wetlands and possibly affecting T&E species. The system's usefulness for access is also being compromised by inadequate erosion and drainage control systems. However rehabilitation over abandonment is an acceptable course of action.

After Situation:

A trail system is installed that provides access to the forested tract and does not cause excessive erosion or water quality degradation.

Feature Measure: Length of trail treated

Scenario Unit: Feet

Scenario Typical Size: 2,000.00

Scenario Total Cost: $8,989.80

Scenario Cost/Unit: $4.49

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	18	$1,409.40
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	18	$2,349.18
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	9	$56.70
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	8	$202.88
Water Bars	1500	Installation of graded trail water controlling structures such as water bars, broad based dips for erosion control. Typical cross section is 1.5 feet high with 4:1 side slopes yielding about 0.33 CY/ft of length.	Feet	$3.10	250	$775.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	18	$516.78
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	36	$1,444.68
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	8	$388.80
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	2	$1,846.38

Practice: 655 - Forest Trails and Landings

Scenario: #4 - Trail Erosion Control without Vegetation, Slopes >35%

Scenario Description:

Rehabilitation of existing forest access trails and landings by addressing legacy resource issues such as sedimentation, for long-term use. Typically the trail is a single lane including cut and fill seasonal road on a moderately steep slope on forestland requiring sustained erosion control measures applied by using heavy equipment such as dozers, backhoes, graders, excavators. The purpose is to hydrologically disconnect existing trail/landing system from the streams and natural drainages. This includes the design and installation of cross drains, rock drains, relief drains, out sloping (or changing road surface drainage), rolling dips and water bars and ditch outs as needed. This scenario applies to only those segments of the trail system that need rehabilitation. Some hand work (chainsaw) will be needed to allow the use of the equipment. The work will be supervised.

Before Situation:

The usefulness of the trail/landing system is being adversely affected by soil erosion.

After Situation:

A trail system is installed that provides access to the forested tract and does not cause excessive erosion or water quality degradation.

Feature Measure: Length of trail treated

Scenario Unit: Feet

Scenario Typical Size: 500.00

Scenario Total Cost: $7,561.62

Scenario Cost/Unit: $15.12

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$100.26	16	$1,604.16
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hours	$145.01	8	$1,160.08
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	9	$56.70
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	8	$202.88
Water Bars	1500	Installation of graded trail water controlling structures such as water bars, broad based dips for erosion control. Typical cross section is 1.5 feet high with 4:1 side slopes yielding about 0.33 CY/ft of length.	Feet	$3.10	150	$465.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	22	$631.62
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	8	$242.88
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	24	$963.12
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	8	$388.80
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	2	$1,846.38

Practice: 655 - Forest Trails and Landings

Scenario: #5 - Grading and Shaping with Vegetative Establishment

Scenario Description:
Rehabilitation of existing forest access trails and landings on a medium slope by addressing rutting, erosion, and sedimentation. Typically the trail is a single, existing seasonal road on gently sloping terrain requiring sustained erosion control measures applied with heavy equipment such as dozers, graders, backhoes, and/or excavators. The purpose is to hydrologically disconnect the existing trail/landing system from streams and natural drainages and to establish a vegetative cover. This scenario includes designing and installation measures such as cross drains, rock drains, relief drainage, out sloping (or changing surface drainage), rolling dips and water bars and ditch outs as needed, and applies to only those segments of the trail system that have resource concerns requiring rehabilitation. It also includes seedbed preparation, seeding to perennial, improved grass and soil amendments determined to be needed. Some hand work (chainsaw) will be needed to allow the use of the equipment. Treatments are for long-term reduction of sediment, restore fish habitat, create fire access and to move routes off unstable slopes.

Before Situation:
The usefulness of the trail/landing system is being adversely affected by soil erosion.

After Situation:
A trail system is installed that provides access to the forested tract and does not cause excessive erosion or water quality degradation.

Feature Measure: Length of trail treated

Scenario Unit: Feet

Scenario Typical Size: 2,000.00

Scenario Total Cost: $6,994.29

Scenario Cost/Unit: $3.50

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	16	$1,058.88
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	8	$50.40
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	1	$14.88
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.61	1	$7.61
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$9.23	1	$9.23
Seeding Operation, Broadcast, Ground	959	Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs.	Acres	$14.02	1	$14.02
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	10	$181.30
Truck, water	1448	Water tanker truck. Equipment only. Labor not included.	Hours	$189.31	6	$1,135.86
Water Bars	1500	Installation of graded trail water controlling structures such as water bars, broad based dips for erosion control. Typical cross section is 1.5 feet high with 4:1 side slopes yielding about 0.33 CY/ft of length.	Feet	$3.10	300	$930.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	16	$459.36
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	40	$1,214.40
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	4	$194.40
Materials						
Nitrogen (N), Ammonium Nitrate	69	Price per pound of N supplied by Ammonium Nitrate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.70	70	$49.00
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.81	55	$44.55
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	40	$27.20
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	$26.18	1	$26.18

Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$47.76	1	$47.76
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 655 - Forest Trails and Landings

Scenario: #72 - Temporary Stream Crossing

Scenario Description:
The design and installation of a temporary stream crossing to address forest health and fish and wildlife habitat management and conservation needs. Improperly designed and/or installed stream crossings can have adverse effects on forest soils, water quality and aquatic wildlife. The temporary stream crossing will be restored and stabilized to natural conditions after use. Approaches to the stream crossing will also be stabilized and rehabilitated after use as necessary. Installation will be supervised by a professional forester, biologist or other qualified specialist. Permanent and/or high-traffic crossings will be designed and installed according to the Stream Crossing (578) Standard. Resource concerns include:Soil Erosion - Streambank, Shoreline, Water Conveyance Channels;Water Quality Degradation - Excessive sediment in surface waters; and,Fish and Wildlife - Inadequate Habitat - Water.

Before Situation:
Access to a forested tract is not available for the installation of conservation practices due to the lack of a suitable stream crossing(s), or, there is a liklihood that there will be traffic through the stream without the benefit of a designed and installed crossing.

After Situation:
Access was available for installing conservation practices, and the streambed, banks, and approaches have been restored to an initial or improved condition.

Feature Measure: Number of crossings

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $2,334.96

Scenario Cost/Unit: $2,334.96

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	2	$261.02
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$56.88	2	$113.76
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	1	$25.36
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	2	$57.42
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	2	$60.72
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	2	$80.26
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	1	$48.60
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 655 - Forest Trails and Landings

Scenario: #73 - Temporary Landing, Sensitive Site

Scenario Description:

The design and installation of a temporary landing/turnaround location on sensitive sites using construction mats that protect resource concerns and meet short-term forest health management and conservation needs. Improperly designed and/or installed landings have adverse effects on water quality and aquatic life. After use, the mats will be removed and the landing area will be restored and stabilized. Use NRCS Conservation Practice Standard (CPS) 654, Road/Trail/Landing Closure and Treatment if surface reshaping or water control is needed; use CPS 342, Critical Area Planting, if only tillage and revegation is needed. Mat installation and removal will be supervised. Resource concerns include: Soil Erosion - Concentrated flow erosion, Ephemeral gully erosion, and Classic gully erosion; and, Water Quality - Excessive sediment in surface waters.

Before Situation:

Appropriate landing areas in a forested tract are not available for the installation of conservation practices due to sensitivity of the site. There is a liklihood that inappropriate areas will be used without the benefit of a designed and installed landing, leading to resource damage.

After Situation:

Conservation practices were installed using a construction mat to stabilize a temporary landing area. Resource damage was avoided, and the landing area has been restored to its previous or better condition.

Feature Measure: Area of landing

Scenario Unit: Square Feet

Scenario Typical Size: 8,400.00

Scenario Total Cost: $24,673.56

Scenario Cost/Unit: $2.94

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	10	$1,305.10
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$56.88	10	$568.80
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	4	$101.44
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	10	$287.10
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	10	$303.60
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	10	$401.30
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	4	$194.40
Materials						
Wood Construction Mat	2657	Wood Construction Mat weekly rental rate per Square Foot of mat. Material Only. Used for access and/or work pad in remote sensitive areas.	Square Feet	$1.18	16800	$19,824.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 655 - Forest Trails and Landings

Scenario: #74 - Temporary Stream Crossing, Sensitive Site

Scenario Description:
The design and installation of a temporary stream crossing on a sensitive site using a wooden construction mat that protects resource concerns. Improperly designed and/or installed stream crossings can have adverse effects on forest soils, water quality and aquatic wildlife. The temporary stream crossing provides access to a forest stand to address forest health, fish and wildlife habitat management, and other conservation needs. The temporary stream crossing and mat are removed when the conservation activity is complete, and the stream crossing and approaches are restored and stabilized to natural conditions. Installation is supervised by a a professional forester, biologist, or other qualified specialist. Permanent and/or high-traffic stream crossings must be designed and installed according to the Stream Crossing (578) Standard. Resource concerns include: Soil Erosion - Concentrated flow erosion, Ephemeral gully erosion, and Classic gully erosion; Fish and Wildlife - Inadequate Habitat - Water; and, Water Quality - Excessive sediment in surface waters.

Before Situation:
A forested tract on a sensitive site cannot be accessed for the installation of conservation practices due to the lack of a suitable stream crossing(s), or, there is a liklihood that there will be traffic through the stream without the benefit of a designed and installed crossing.

After Situation:
The sensitive site was accessed for installing conservation practices, and the streambed, banks, and approaches have been restored and stabilized to natural conditions.

Feature Measure: Number of crossings of a 10 foot wi

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $3,159.24

Scenario Cost/Unit: $3,159.24

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	3	$391.53
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$56.88	3	$170.64
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	1	$25.36
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	2	$57.42
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	3	$91.08
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	3	$120.39
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	1	$48.60
Materials						
Wood Construction Mat	2657	Wood Construction Mat weekly rental rate per Square Foot of mat. Material Only. Used for access and/or work pad in remote sensitive areas.	Square Feet	$1.18	480	$566.40
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 655 - Forest Trails and Landings

Scenario: #75 - Temporary Wetland Crossing, Sensitive Site

Scenario Description:

The design and installation of a temporary wetland crossing to gain access to a forest stand, built with construction mats to protect natural resources while addressing forest health management, wildlife habitat, and other conservation objectives. Improperly designed and/or installed wetland crossings can have adverse effects on soil health, water quality, and wildlife.?? After conservation activities are completed, the construction mats will be removed and the wetland crossing will be restored and stabilized to a natural condition. Installation is supervised by a a professional forester, biologist, or other qualified specialist. Resource concerns include: Water Quality - Excessive sediment in surface waters, and Fish and Wildlife - Inadequate Habitat - Water.

Before Situation:

A forested tract on a sensitive site cannot be accessed for the installation of conservation practices due to the lack of a suitable wetland crossing(s). There is a liklihood that there will be traffic through the environmentally sensitive wetland without the benefit of a designed and installed wetland crossing, leading to resource damage.

After Situation:

Conservation practices were installed in the forested tract. The environmentally sensitive wetland was crossed using a construction mat to stabilize the site, and the wetland was subsequently restored and stabilized to natural conditions.

Feature Measure: Crossing for 530 linear feet of wetla

Scenario Unit: Square Feet

Scenario Typical Size: 6,600.00

Scenario Total Cost: $19,131.28

Scenario Cost/Unit: $2.90

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	6	$783.06
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$56.88	6	$341.28
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	2	$50.72
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	6	$172.26
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	6	$182.16
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	6	$240.78
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	2	$97.20
Materials						
Wood Construction Mat	2657	Wood Construction Mat weekly rental rate per Square Foot of mat. Material Only. Used for access and/or work pad in remote sensitive areas.	Square Feet	$1.18	13200	$15,576.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 656 - Constructed Wetland

Scenario: #13 - Constructed Wetland

Scenario Description:

This practice scenario includes the basic earthwork and native and/or organic wetland vegetation needed to create a constructed wetland to treat contaminated agricultural runoff. All other components, such as water control structures, dikes or upstream sediment basins, must be paid for under facilitating practices. Soil, water and tissue sampling are required. The purpose of the practice is to address resource concerns related to water quality degradation due to excess nutrient and pathogens. Associated practices: Structure for Water Control (587); Sediment Basin (350); Dike (356); Pond Sealing or Lining, Compacted Clay Treatment (521D); Pond Sealing or Lining, Flexible Membrane (521A); Fence (382); Grade Stabilization Structure (410); Pumping Plant (533); Waste Transfer (634)

Before Situation:

Contaminated agricultural runoff causes excess ponding and/or water quality degradation.

After Situation:

A 0.25 acre constructed wetland (i.e. 45' x 240') will be constructed with an average 18' depth. Only the earthwork and wetland vegetation are considered in this scenario. Any structures or sediment basins will be designed under a separate practice. The constructed wetland is sited near the property boundary, but still takes cropland out of production (1/2 wetland acreage). The constructed wetland treats the effluent by reducing excess nutrients and adding oxygen through wetland plants and functions before the effluent is transported to a waste storage facility or discharged off site, if permitted by regulation.

Feature Measure: Area of Constructed Wetland

Scenario Unit: Acres

Scenario Typical Size: 0.25

Scenario Total Cost: $4,671.36

Scenario Cost/Unit: $18,685.44

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Clearing and Grubbing	40	Clearing and Grubbing, includes materials, equipment and labor	Acres	$288.95	0.25	$72.24
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yards	$0.87	200	$174.00
Excavation, common earth, small equipment, 50 ft	1220	Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yards	$2.81	400	$1,124.00
Foregone Income						
FI, Hay, General Grass	2122	General Grass Hay is Primary Land Use	Ton	$49.18	0.12	$5.90
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	14	$401.94
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$14.19	2	$28.38
Test, Plant Tissue Test	301	Tissue analysis for crops. Includes materials and shipping only.	Each	$25.27	1	$25.27
Test, Standard Water Test, Well Water	309	Well Water Suitability test. Includes materials and shipping only.	Each	$53.50	8	$428.00
Native Aquatic Plants, Emergent or Submerged	2336	Native aquatic emergent or submerged. All required materials for establishing vegetation. Includes material and shipping.	Each	$1.22	1350	$1,647.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 657 - Wetland Restoration

Scenario: #2 - Riverine Levee Removal and Floodplain Features

Scenario Description:

A Riverine HGM tract on a large floodplain is to be restored. It has been converted to agricultural production by surface ditching and clearing of woody vegetation. The size of the tract is 100 acres. The wetland extent is 60 acres, and 40 acres are adjacent non-wetland. Resource Concerns are: 4-SOIL QUALITY DEGRADATION - Organic matter depletion, 11- WATER QUALITY DEGRADATION - Excess nutrients in surface and ground waters, 12 - WATER QUALITY DEGRADATION - Pesticides transported to surface and ground waters, 16 - WATER QUALITY DEGRADATION - Excessive sediment in surface waters, 18 - DEGRADED PLANT CONDITION - Undesirable plant productivity and health, 19 - DEGRADED PLANT CONDITION, Inadequate strucuture and composition, 22- INADEQUATE HABITAT FOR FISH AND WILDLIFE - Habitat degradation.

Before Situation:

A levee prevents floodwater from entering the tract. The original cover was forest. The site is drained by surface ditches which collect surface water and direct it to the river through a flap gate structure. The site has been completely cleared, and no suitable adjacent seedwall exists for natural regeneration of forest species. The lateral connectivity between the channel and floodplain has been altered by construction of levees along the reach.

After Situation:

The hydrology of the site is restored with the installation of ditch plugs, and the excavation of macrotopographic features with an average depth of 6' over 30% of the wetland area. Excavated spoil is placed adjacent to the features on the wetland and adjacent non-wetland area with a maximum depth of 24 inches. The levee has been breached at the upstream and downstream ends of the tract reach, restoring dynamic stream flooding. The breach length is 150 feet long at both locations. Both the wetland and non-wetland areas are planted with a Bottomland Hardwood species mix. The levee breaches are armored with rock riprap. Facilitating practices include Grade Stabilization Structure and Tree and Shrub Planting. Restoration of hydrology and plant community functions will improve the WATER QUALITY and DEGRADED PLANT CONDITION concerns listed above. The hydrologic and vegetative practices will address the SOIL QUALITY DEGRADATION and INADEQUATE HABITAT FOR FISH AND WILDLIFE concerns.

Feature Measure: Acres of Tract

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $56,645.17

Scenario Cost/Unit: $566.45

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	16520	$41,630.40
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$415.54	20	$8,310.80
FI, Hay, General Grass	2122	General Grass Hay is Primary Land Use	Ton	$49.18	80	$3,934.40
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	3	$2,769.57

Practice: 657 - Wetland Restoration

Scenario: #3 - Depression Sediment Removal and Ditch Plug

Scenario Description:

A Depressional HGM class wetland is to be restored. The tract size is 15 acres, and the actual wetland size is 10 acres. The site is a recharge depression, fed only from surface runoff. Resource Concerns are: 4-SOIL QUALITY DEGRADATION - Organic matter depletion, 11- WATER QUALITY DEGRADATION - Excess nutrients in surface and ground waters, 12 - WATER QUALITY DEGRADATION - Pesticides transported to surface and ground waters, 16 - WATER QUALITY DEGRADATION - Excessive sediment in surface waters, 18 - DEGRADED PLANT CONDITION - Undesirable plant productivity and health, 19 - DEGRADED PLANT CONDITION, Inadequate strucuture and composition, 22- INADEQUATE HABITAT FOR FISH AND WILDLIFE - Habitat degradation.

Before Situation:

The wetland has been converted to agricultural production, and the tract drained with a surface ditch. The ditch is 4' average depth, and 12 feet average width. The wetland receives surface runoff from an adjacent upland watershed, and ponds water on a shallow perched layer. The watershed has been converted from native to agricultural landuse, and the resultant soil erosion has deposited 6' of sediment in the bottom of the depression.

After Situation:

The ditch has been plugged by the installation of a 50' long section of compacted clay fill, and the deposition has been removed down to the original topsoil layer. A herbaceous plant community has been seeded. Facilitative practices include Conservation Cover. Restoration of hydrology and plant community functions will improve the WATER QUALITY and DEGRADED PLANT CONDITION concerns listed above. The hydrologic and vegetative practices will address the SOIL QUALITY DEGRADATION and INADEQUATE HABITAT FOR FISH AND WILDLIFE concerns.

Feature Measure: Acres of Tract

Scenario Unit: Acres

Scenario Typical Size: 15.00

Scenario Total Cost: $24,368.89

Scenario Cost/Unit: $1,624.59

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	8067	$20,328.84
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	89	$356.89
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$415.54	3	$1,246.62
FI, Hay, General Grass	2122	General Grass Hay is Primary Land Use	Ton	$49.18	12	$590.16
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	2	$1,846.38

Practice: 657 - Wetland Restoration

Scenario: #6 - Tile Break

Scenario Description:

The tract size is 80 Acres interspersed with shallow depressions. The typical wetland size is 1 acre. Resource Concerns are: 4-SOIL QUALITY DEGRADATION - Organic matter depletion, 11- WATER QUALITY DEGRADATION - Excess nutrients in surface and ground waters, 12 - WATER QUALITY DEGRADATION - Pesticides transported to surface and ground waters, 16 - WATER QUALITY DEGRADATION - Excessive sediment in surface waters, 18 - DEGRADED PLANT CONDITION - Undesirable plant productivity and health, 19 - DEGRADED PLANT CONDITION, Inadequate strucuture and composition, 22- INADEQUATE HABITAT FOR FISH AND WILDLIFE - Habitat degradation.

Before Situation:

The site has been drained with a tile drain system. A suitable seed bank exists for natural regeneration to re-establish hydrophytic vegetation. The site is in agricultural production.

After Situation:

The drain tiles have been rendered non-functional by excavation of tile, replacing with non-perforated tile and backfilling with excavated earth, which is compacted with the excavator bucket. There are no facilitating practices. Restoration of hydrology and plant community functions will improve the WATER QUALITY and DEGRADED PLANT CONDITION concerns listed above. The hydrologic and vegetative practices will address the SOIL QUALITY DEGRADATION and INADEQUATE HABITAT FOR FISH AND WILDLIFE concerns.

Feature Measure: Tile break

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $804.94

Scenario Cost/Unit: $804.94

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$66.18	4	$264.72
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	4	$114.84
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	4	$121.44
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 657 - Wetland Restoration

Scenario: #7 - Ditch Plug

Scenario Description:

A depressional wetland is to be restored. The tract size is 80 Acres consists of surface saturated soils interspersed with shallow depressional wetlands. The wetland size is 1.0 acre. Resource Concerns are: 4-SOIL QUALITY DEGRADATION - Organic matter depletion, 11- WATER QUALITY DEGRADATION - Excess nutrients in surface and ground waters, 12 - WATER QUALITY DEGRADATION - Pesticides transported to surface and ground waters, 16 - WATER QUALITY DEGRADATION - Excessive sediment in surface waters, 18 - DEGRADED PLANT CONDITION - Undesirable plant productivity and health, 19 - DEGRADED PLANT CONDITION, Inadequate strucuture and composition, 22-INADEQUATE HABITAT FOR FISH AND WILDLIFE - Habitat degradation.

Before Situation:

The site has been drained with a surface ditch. A suitable seed bank exists for natural regeneration to re-establish hydrophytic vegetation. The site is in agricultural production.

After Situation:

The surface ditch has been rendered non-functional by backfilling with excavated earth, which is compacted with the excavator bucket. There are no facilitating practices. Restoration of hydrology and plant community functions will improve the WATER QUALITY and DEGRADED PLANT CONDITION concerns listed above. The hydrologic and vegetative practices will address the SOIL QUALITY DEGRADATION and INADEQUATE HABITAT FOR FISH AND WILDLIFE concerns.

Feature Measure: Ditch Plug

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $1,186.98

Scenario Cost/Unit: $1,186.98

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, common earth, small equipment, 50 ft	1220	Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yards	$2.81	23	$64.63
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	4	$114.84
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	8	$242.88
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 657 - Wetland Restoration

Scenario: #8 - Embankment

Scenario Description:

A depressional wetland is to be restored. The tract size is 80 Acres consists of surface saturated soils interspersed with shallow depressional wetlands. The wetland size is 1.0 acres. Resource Concerns are: 4-SOIL QUALITY DEGRADATION - Organic matter depletion, 11- WATER QUALITY DEGRADATION - Excess nutrients in surface and ground waters, 12 - WATER QUALITY DEGRADATION - Pesticides transported to surface and ground waters, 16 - WATER QUALITY DEGRADATION - Excessive sediment in surface waters, 18 - DEGRADED PLANT CONDITION - Undesirable plant productivity and health, 19 - DEGRADED PLANT CONDITION, Inadequate strucuture and composition, 22-INADEQUATE HABITAT FOR FISH AND WILDLIFE - Habitat degradation.

Before Situation:

The site has been drained with a surface ditch. A suitable seed bank exists for natural regeneration to re-establish hydrophytic vegetation. The site is in agricultural production.

After Situation:

The surface ditch has been rendered non-functional by installing an earth embankment, which is compacted with the excavator bucket. There are no facilitating practices. Restoration of hydrology and plant community functions will improve the WATER QUALITY and DEGRADED PLANT CONDITION concerns listed above. The hydrologic and vegetative practices will address the SOIL QUALITY DEGRADATION and INADEQUATE HABITAT FOR FISH AND WILDLIFE concerns.

Feature Measure: Embankment

Scenario Unit: Cubic Yards

Scenario Typical Size: 250.00

Scenario Total Cost: $2,483.67

Scenario Cost/Unit: $9.93

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 105 HP	1320	Track mounted Dozer with horsepower range of 90 to 125. Equipment and power unit costs. Labor not included.	Hours	$92.95	10	$929.50
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	10	$401.30
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 657 - Wetland Restoration

Scenario: #9 - Scrape, average depth 12 inch

Scenario Description:

Excavation to create shallow water for wildlife habitat up to 12' water depth, with wetland plants to provide habitat suitable for desired species. The typical wetland size is 1 acre. Resource Concerns are: 4-SOIL QUALITY DEGRADATION - Organic matter depletion, 11- WATER QUALITY DEGRADATION - Excess nutrients in surface and ground waters, 12 - WATER QUALITY DEGRADATION - Pesticides transported to surface and ground waters, 16 - WATER QUALITY DEGRADATION - Excessive sediment in surface waters, 18 - DEGRADED PLANT CONDITION - Undesirable plant productivity and health, 19 - DEGRADED PLANT CONDITION, Inadequate structure and composition, 22-INADEQUATE HABITAT FOR FISH AND WILDLIFE - Habitat degradation.

Before Situation:

The site is in agricultural production and no longer provides wildlife habitat due to a lack of ponded water. A suitable seed bank exists for natural regeneration to re-establish hydrophytic vegetation.

After Situation:

An excavation with an average depth of 12' has created a shallow depression which intercepts surface runoff. The excavated material has been spread on adjacent areas. The INADEQUATE HABITAT FOR FISH AND WILDLIFE resource concern has been addressed with the provision of seasonal open water for terrestrial, aquatic, and waterfowl species.

Feature Measure: Area of scrape

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $6,795.19

Scenario Cost/Unit: $6,795.19

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yards	$3.67	1600	$5,872.00
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 657 - Wetland Restoration

Scenario: #10 - Scrape, average depth 24 inch

Scenario Description:

Excavation to create shallow water for wildlife habitat up to 24' water depth, with wetland plants to provide habitat suitable for desired species. The typical wetland size is 1 acre. Resource Concerns are: 4-SOIL QUALITY DEGRADATION - Organic matter depletion, 11- WATER QUALITY DEGRADATION - Excess nutrients in surface and ground waters, 12 - WATER QUALITY DEGRADATION - Pesticides transported to surface and ground waters, 16 - WATER QUALITY DEGRADATION - Excessive sediment in surface waters, 18 - DEGRADED PLANT CONDITION - Undesirable plant productivity and health, 19 - DEGRADED PLANT CONDITION, Inadequate structure and composition, 22-INADEQUATE HABITAT FOR FISH AND WILDLIFE - Habitat degradation.

Before Situation:

The site is in agricultural production and no longer provides wildlife habitat due to a lack of ponded water. A suitable seed bank exists for natural regeneration to re-establish hydrophytic vegetation.

After Situation:

An excavation with an average depth of 24' has created a shallow depression which intercepts surface runoff. The excavated material has been spread on adjacent areas. The INADEQUATE HABITAT FOR FISH AND WILDLIFE resource concern has been addressed with the provision of seasonal open water for terrestrial, aquatic, and waterfowl species.

Feature Measure: Area of scrape

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $12,667.19

Scenario Cost/Unit: $12,667.19

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yards	$3.67	3200	$11,744.00
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	1	$923.19

Practice: 658 - Wetland Creation

Scenario: #2 - development of shallow water area for wildlife

Scenario Description:

Shallow Water Development, pushout with excavation equipment and locate spoil on site to create 18' water. Small site where hydrology and topography facilitate shallow water for wildlife habitat and feeding. Construct 1 embankment 250' long, 3' tall with 8' top width and 5:1 side slopes. Use critical area planting for seeding of the slopes and water control structure as needed. add wetland plants to provide habitat suitable for desired species.

Before Situation:

The site is in cropland on an upland, non floodplain site (interfluve). Farm with open land and a small 1.5 acre site without adequate shallow water habitat for shorebirds, waterfowl, wading birds, reptiles, amphibians, or other species of concern in the state that require shallow water for at least part of their life cycle. Desired wildlife species of concern lack habitat and adequate sites to support migration. Water depth is not managed to support habitat.

After Situation:

A pushout is developed to create area that intercepts surface runoff. The INADEQUATE HABITAT FOR FISH AND WILDLIFE resource concern has been addressed with the provision of seasonal open water for terrestrial, aquatic, and waterfowl species. Shallow water area is maintained in 1 to 18 inches over the majority of the pool area to support feeding and protection for migrating wildlife including shorebirds, waterfowl, and wading birds species of concern and provides adequate habitat for desired species. Shallow water area supports connectivity of food, cover, space, and water to meet the requirements of identified wildlife and invertebrate species.

Feature Measure: acre of shallow water

Scenario Unit: Acres

Scenario Typical Size: 1.50

Scenario Total Cost: $3,729.18

Scenario Cost/Unit: $2,486.12

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, common earth, small equipment, 50 ft	1220	Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yards	$2.81	1055	$2,964.55
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 659 - Wetland Enhancement

Scenario: #27 - Mineral Flat

Scenario Description:

A Mineral Flat wetland is to be enhanced. The tract size is 160 Acres consists of surface saturated soils interspersed with shallow depressions that are not depressional class HGM wetlands. The wetland size is also 160 acres. Resource Concerns are: 4-SOIL QUALITY DEGRADATION - Organic matter depletion, 11- WATER QUALITY DEGRADATION - Excess nutrients in surface and ground waters, 12 - WATER QUALITY DEGRADATION - Pesticides transported to surface and ground waters, 16 - WATER QUALITY DEGRADATION - Excessive sediment in surface waters, 18 - DEGRADED PLANT CONDITION - Undesirable plant productivity and health, 19 - DEGRADED PLANT CONDITION, Inadequate strucuture and composition, 22- INADEQUATE HABITAT FOR FISH AND WILDLIFE - Habitat degradation.

Before Situation:

The site has been drained with a tile drain system. A suitable seed bank exists for natural regeneration to re-establish hydrophytic vegetation. The site is in agricultural production.

After Situation:

The drain tiles have been rendered non-functional by excavating 50 foot lengths of tile mains and laterals in 24 separate locations, and backfilling with excavated earth, which is compacted with the excavator bucket. There are no facilitating practices. Enhancement of hydrology and plant community functions will improve the WATER QUALITY and DEGRADED PLANT CONDITION concerns listed above. The hydrologic and vegetative practices will address the SOIL QUALITY DEGRADATION and INADEQUATE HABITAT FOR FISH AND WILDLIFE concerns.

Feature Measure: Acres of Tract

Scenario Unit: Acres

Scenario Typical Size: 160.00

Scenario Total Cost: $3,921.59

Scenario Cost/Unit: $24.51

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hydraulic Excavator, .5 CY	930	Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included.	Hours	$101.18	24	$2,428.32
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	24	$728.64
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 659 - Wetland Enhancement

Scenario: #28 - Riverine Levee Removal and Floodplain Features

Scenario Description:

A Riverine HGM tract on a large floodplain is to be enhanced. It has been converted to agricultural production by surface ditching and clearing of woody vegetation. The size of the tract is 100 acres. The wetland extent is 60 acres, and 40 acres are adjacent non-wetland. Resource Concerns are: 4-SOIL QUALITY DEGRADATION - Organic matter depletion, 11- WATER QUALITY DEGRADATION - Excess nutrients in surface and ground waters, 12 - WATER QUALITY DEGRADATION - Pesticides transported to surface and ground waters, 16 - WATER QUALITY DEGRADATION - Excessive sediment in surface waters, 18 - DEGRADED PLANT CONDITION - Undesirable plant productivity and health, 19 - DEGRADED PLANT CONDITION, Inadequate strucuture and composition, 22- INADEQUATE HABITAT FOR FISH AND WILDLIFE - Habitat degradation.

Before Situation:

A levee prevents floodwater from entering the tract. The original cover was forest. The site is drained by surface ditches which collect surface water and direct it to the river through a flap gate structure. The site has been completely cleared, and no suitable adjacent seedwall exists for natural regeneration of forest species. The lateral connectivity between the channel and floodplain has been altered by construction of levees along the reach.

After Situation:

The hydrology of the site is enhanced with the installation of ditch plugs, and the excavation of macrotopographic features with an average depth of 6' over 30% of the wetland area. Excavated spoil is placed adjacent to the features on the wetland and adjacent non-wetland area with a maximum depth of 24 inches. The levee has been breached at the upstream and downstream ends of the tract reach, restoring dynamic stream flooding. The breach length is 150 feet long at both locations. Both the wetland and non-wetland areas are planted with a Bottomland Hardwood species mix. The levee breaches are armored with rock riprap. Facilitating practices include Grade Stabilization Structure and Tree and Shrub Planting. Restoration of hydrology and plant community functions will improve the WATER QUALITY and DEGRADED PLANT CONDITION concerns listed above. The hydrologic and vegetative practices will address the SOIL QUALITY DEGRADATION and INADEQUATE HABITAT FOR FISH AND WILDLIFE concerns.

Feature Measure: Acres of Tract

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $51,279.57

Scenario Cost/Unit: $512.80

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	19250	$48,510.00
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	3	$2,769.57

Practice: 659 - Wetland Enhancement

Scenario: #29 - Depression Sediment Removal and Ditch Plug

Scenario Description:

A Depressional HGM class wetland is to be enhanced. The tract size is 15 acres, and the actual wetland size is 10 acres. The site is a recharge depression, fed only from surface runoff. Resource Concerns are: 4-SOIL QUALITY DEGRADATION - Organic matter depletion, 11- WATER QUALITY DEGRADATION - Excess nutrients in surface and ground waters, 12 - WATER QUALITY DEGRADATION - Pesticides transported to surface and ground waters, 16 - WATER QUALITY DEGRADATION - Excessive sediment in surface waters, 18 - DEGRADED PLANT CONDITION - Undesirable plant productivity and health, 19 - DEGRADED PLANT CONDITION, Inadequate strucuture and composition, 22- INADEQUATE HABITAT FOR FISH AND WILDLIFE - Habitat degradation.

Before Situation:

The wetland has been converted to agricultural production, and the tract drained with a surface ditch. The ditch is 4' average depth, and 12 feet average width. The wetland receives surface runoff from an adjacent upland watershed, and ponds water on a shallow perched layer. The watershed has been converted from native to agricultural landuse, and the resultant soil erosion has deposited 6' of sediment in the bottom of the depression.

After Situation:

The ditch has been plugged by the installation of a 50' long section of compacted clay fill, and the deposition has been removed down to the original topsoil layer. A herbaceous plant community has been seeded. Facilitative practices include Conservation Cover. Restoration of hydrology and plant community functions will improve the WATER QUALITY and DEGRADED PLANT CONDITION concerns listed above. The hydrologic and vegetative practices will address the SOIL QUALITY DEGRADATION and INADEQUATE HABITAT FOR FISH AND WILDLIFE concerns.

Feature Measure: Acres of Tract

Scenario Unit: Acres

Scenario Typical Size: 15.00

Scenario Total Cost: $22,532.11

Scenario Cost/Unit: $1,502.14

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	8067	$20,328.84
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic Yards	$4.01	89	$356.89
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	2	$1,846.38

Practice: 659 - Wetland Enhancement

Scenario: #30 - Estuarine Fringe Levee Removal

Scenario Description:

An Estuarine Fringe HGM landscape is to be enhanced. The wetland is subject to tidally induced water level fluctuations. The tract size is 120 acres, and the wetland area is 100 acres. Resource Concerns are: 4-SOIL QUALITY DEGRADATION - Organic matter depletion, 11- WATER QUALITY DEGRADATION - Excess nutrients in surface and ground waters, 12 - WATER QUALITY DEGRADATION - Pesticides transported to surface and ground waters, 16 - WATER QUALITY DEGRADATION - Excessive sediment in surface waters, 18 - DEGRADED PLANT CONDITION - Undesirable plant productivity and health, 19 - DEGRADED PLANT CONDITION, Inadequate strucuture and composition, 22- INADEQUATE HABITAT FOR FISH AND WILDLIFE - Habitat degradation.

Before Situation:

The wetland has been converted to agricultural production by construction of a dike to prevent tidal flows. The dike has a culvert with a flapgate to allow surface water to flow out, but prevents tide water from entering. The dike is 7 feet high above the current marsh surface. The dike has side slopes of 3:1, with a 12 foot top. A suitable seedbank exists for natural regeneration of the original plant community. The soils are organic, and loss of hydrology has caused the land surface to subside 3 feet due to aerobic decomposition of organic matter (mineralization).

After Situation:

The dike has been breached in 4 locations, corresponding to the number of original inlet channels. The breach locations have 8 foot long steel sheet pile Structures for Water Control installed to prevent tidal surges from causing serious erosion on the subsided land surface. The original flap gate culvert has been removed. The dike is 4 feet higher than the weir crests, so the excavations are 4 feet by 8 feet long, with 3:1 side slopes. The culvert has been removed and salvaged by the landowner. Facilitating practices are Structure for Water Control. Restoration of hydrology and plant community functions will improve the WATER QUALITY and DEGRADED PLANT CONDITION concerns listed above. The hydrologic and vegetative practices will address the SOIL QUALITY DEGRADATION and INADEQUATE HABITAT FOR FISH AND WILDLIFE concerns.

Feature Measure: Acres of Tract

Scenario Unit: Acres

Scenario Typical Size: 120.00

Scenario Total Cost: $3,485.25

Scenario Cost/Unit: $29.04

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	284	$715.68
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	3	$2,769.57

Practice: 659 - Wetland Enhancement

Scenario: #31 - Riverine Channel and Floodplain Restoration

Scenario Description:

A Riverine HGM landscape on a small stream on a low stream order riparian landscape has been converted to agricultural production. The stream channel has degraded. The reach is 1500 feet in length, and the tract size is 15 acres. The wetland area is 10 acres. Resource Concerns are: 4-SOIL QUALITY DEGRADATION - Organic matter depletion, 11- WATER QUALITY DEGRADATION - Excess nutrients in surface and ground waters, 12 - WATER QUALITY DEGRADATION - Pesticides transported to surface and ground waters, 16 - WATER QUALITY DEGRADATION - Excessive sediment in surface waters, 18 - DEGRADED PLANT CONDITION - Undesirable plant productivity and health, 19 - DEGRADED PLANT CONDITION, Inadequate strucuture and composition, 22- INADEQUATE HABITAT FOR FISH AND WILDLIFE - Habitat degradation.

Before Situation:

Channel incision has broken the lateral connectivity between the stream and floodplain. The coversion to cropland was accompanied by filling and leveling of backswamp, side channel, and oxbow features which formerly ponded water or exposed the floodplain groundwater table. The site no longer has access to floodwater or water surface profile supported groundwater. No suitable seed bank exists for natural regeneration of the original hydrophytic plant community, either in the channel, or on the floodplain.

After Situation:

The hydrology of the site is restored by the installation of a series of rock check structures to raise the stream water surface profile. Floodplain macrotopographic features replicating the original side channels, oxbows, and backswamps are constructed by excavation. Spoil is placed adjacent to the excavations to replicate natural depositional features. The average depth of the excavated features is 2 feet, and the surface area of the excavations is 25% of the tract size. The eroding stream bank is stabilized with soil bio-engineering features, and fish habitat improvement measures are installed in the channel. The tract is seeded to appropriate hydrophytic and upland vegetation, both woody and herbaceous. Facilitating practices are Streambank and Shoreline protection, Structure for Water Control, Conservation Cover, Tree/Shrub Establishment, and Stream Habitat Improvement and Management. Restoration of hydrology and plant community functions will improve the WATER QUALITY and DEGRADED PLANT CONDITION concerns listed above. The hydrologic and vegetative practices will address the SOIL QUALITY DEGRADATION and INADEQUATE HABITAT FOR FISH AND WILDLIFE concerns.

Feature Measure: Acres of Tract

Scenario Unit: Acres

Scenario Typical Size: 15.00

Scenario Total Cost: $9,469.38

Scenario Cost/Unit: $631.29

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	3025	$7,623.00
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	2	$1,846.38

Practice: 660 - Tree-Shrub Pruning

Scenario: #1 - Pruning-Fire Hazard

Scenario Description:
Pruning trees of branches in a forest stand where wildfires are considered a high and very high hazard. Hand tools and power tools are used to cut branches from trees.

Before Situation:
The forest stand is well to over-stocked, generally with 200 to 300+ trees per acre. Branches are touching understory vegetation or are in close proximity to forest floor where a ground fire can ignite the lower branches and move into the upper canopy. Wildfire hazard is very high.

After Situation:
Trees are pruned to the desirable height (generally 8-10') based on desired separation space between ground vegetation and tree crown. Pruned branches are treated if they are a hazard.

Feature Measure: area of treatment

Scenario Unit: Acres

Scenario Typical Size: 20.00

Scenario Total Cost: $4,830.60

Scenario Cost/Unit: $241.53

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	120	$756.00
Pruning tools, hand tools	1318	Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included.	Hours	$2.31	20	$46.20
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	120	$3,445.20
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	12	$583.20

Practice: 660 - Tree-Shrub Pruning

Scenario: #2 - Pruning-Low Height

Scenario Description:
Pruning is done on identified trees to improve stem quality and reduce fire hazard by hand with chain saws, tree loppers, hand shears, or hand saws. Trees are growing at a fast pace, with leader growth on trees anywhere from 1.5 feet to 4 feet in length.

Before Situation:
Trees are retaining lower limbs along the entire tree bole, reducing wood quality and creating a fire hazard. Pruning height will be based on overall stand diameter and height. Stand has been thinned and crop trees are identified for pruning.

After Situation:
Trees are pruned to the desirable height of 8-10 feet. Pruned branches are treated if they are a hazard, see Woody Residue Treatment standard.

Feature Measure: area of treatment

Scenario Unit: Acres

Scenario Typical Size: 20.00

Scenario Total Cost: $3,699.90

Scenario Cost/Unit: $185.00

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	80	$504.00
Pruning tools, hand tools	1318	Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included.	Hours	$2.31	20	$46.20
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	80	$2,296.80
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	15	$729.00
Materials						
Tree Marking Paint	313	Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only.	Acres	$12.39	10	$123.90

Practice: 660 - Tree-Shrub Pruning

Scenario: #3 - Pruning- High Height

Scenario Description:

Pruning is done by hand with pole saws or with gas pole saw. Crop trees are identified for pruning. The forest is on highly productive soils. Trees are growing at a fast pace, with leader growth on trees anywhere from 1.5 feet to 4 feet in length. To improve the quality of the stem wood, branches are pruned from the trees. Resource Concerns would be Degraded Plant Condition--Undesirable plant productivity and heath, Excessive plant pest pressure, and Wildlife hazard.

Before Situation:

Trees are retaining limbs mostly along the mid to upper section of the tree bole, reducing quality. Lower branches (0-8 feet) may have already been pruned, have naturally self pruned to differing heights. Pruning height is at least to eighteen (18) feet above the ground.

After Situation:

The typical forest pruning treatment is 20 acres. Trees are pruned to the height of 18 feet or more. Pruned branches are treated so they do not become a fire risk. Plant health condition would be satisfactory after pruning.

Feature Measure: area of treatment

Scenario Unit: Acres

Scenario Typical Size: 20.00

Scenario Total Cost: $8,491.40

Scenario Cost/Unit: $424.57

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	50	$315.00
Pruning tools, hand tools	1318	Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included.	Hours	$2.31	50	$115.50
Pruning tool, pole saw	1319	Gasoline powered pole chainsaw. Labor not included.	Hours	$9.80	100	$980.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	200	$5,742.00
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	25	$1,215.00
Materials						
Tree Marking Paint	313	Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only.	Acres	$12.39	10	$123.90

Practice: 660 - Tree-Shrub Pruning

Scenario: #14 - Root Pruning for Oak Wilt Control

Scenario Description:

A Natural Resource Professional, e.g., Forester, Biologist, Pathologist, determines the extent of an Oak Wilt infection and delineates the treatment area. Brush and small trees are removed from treatment area (trencher line) using a combination of a bulldozer and chainsaw. A trencher or vibratory plow is then used to sever root grafts between adjacent oak trees to stop the spread of Oak Wilt from infected trees to healthy trees. Trees within treatment area are treated with herbicide to ensure mortality of all diseased trees and further reduce chance of disease spread. This addresses the following Resource Concerns: 'Plants: Degraded Plant Condition: Undesirable plant productivity and health' and 'Plants: Degraded Plant Condition: Excessive plant pest pressure.'

Before Situation:

A defined area of oak trees infected with the fatal disease Oak Wilt (Ceratocystis fagacearum) has been identified by a trained and certified natural resource professional. Without intervention, Oak Wilt will spread from infected trees into surrounding oak forest through underground root grafts between neighboring trees, eventually killing the entire stand.

After Situation:

A trencher or vibratory plow has severed all root grafts to a depth of 5' in a complete ring around the group of infected trees, in accordance with guidance in 'Oak Wilt in Michigan's Forest Resource' (MSUE Bulletin E-3169), or other state-issued guidance. The risk of oak tree mortality from Oak Wilt outside of the initial infection area has been reduced or eliminated. The forest stand is the acreage improved by root pruning for Oak Wilt control.

Feature Measure: Feet of trench/plow line cut

Scenario Unit: Linear Feet

Scenario Typical Size: 1,000.00

Scenario Total Cost: $4,804.39

Scenario Cost/Unit: $4.80

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$100.26	3	$300.78
Trencher, 8 in.	936	Equipment and power unit costs. Labor not included.	Hours	$50.98	5	$254.90
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	8	$50.40
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$81.82	3	$245.46
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	8	$350.96
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	8	$242.88
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	16	$1,783.20
Materials						
Tree Marking Paint	313	Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only.	Acres	$12.39	1	$12.39
Herbicide, Triclopyor	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acres	$34.16	1	$34.16
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 660 - Tree-Shrub Pruning

Scenario: #32 - Pruning Individual Agroforestry tree - small acreage

Scenario Description:
In agroforestry settings (crop or forest lands) overstory tree crowns are pruned to increase sunlight to understory shrubs, low growing trees, and crop plants that have been purposely established to grow on the same ground. Thirty trees or less per acre require pruning. Associated Conservation Practice Standard (CPS) 384 - Woody Residue Treatment. Resource concern is degraded plant condition - undesirable plant productivity and health.

Before Situation:
Overstory trees are expanding their crowns, providing too much shade on the understory plants. The shade is affecting the growth and production of the understory plants. Pruning branches, leaves, frawns, etc. are needed to maintain the desired about of sunlight reaching the understory.

After Situation:
Pruning of the overstory tree crowns is completed, allowing the proper amount of sunlight to reach the understory vegetation, maintaining their grown, health and vigor, and wildlife benefits. Typical treatment area is less than 1 acre; typical scenario based on 1 ac, 30 TPA.

Feature Measure: Tree Pruned

Scenario Unit: Each

Scenario Typical Size: 30.00

Scenario Total Cost: $417.87

Scenario Cost/Unit: $13.93

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	5	$31.50
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	1	$25.36
Pruning tools, hand tools	1318	Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included.	Hours	$2.31	3	$6.93
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	5	$219.35
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	3	$86.13
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	1	$48.60

Practice: 666 - Forest Stand Improvement

Scenario: #7 - Patch Clearcuts, Non-commercial

Scenario Description:
Creating openings of 0.5 to 2 acres within degraded stands, or in older stands where regenerating young forest is lacking. A forester marks locations for patch creation so that young forest will regenerate in openings, and less-desirable groups of trees will be cut. Tree felling is accomplished with hand tools such as chainsaws. Resource concerns include: - Undesirable plant productivity and health; - Inadequate structure and composition; and - Wildlife habitat degradation.

Before Situation:
The existing stand is not regenerating to the desired species composition, and/or has been degraded by past harvesting practices. The trees currently on the site are of species or structure such that managing them will not achieve desired conditions in addressing resource concerns and meeting landowners' objectives. Site and tree species' attributes are such that creating openings will facilitate regeneration of shade-intolerant species.

After Situation:
The stand contains patches of new, young trees of desirable species, providing for wildlife that utilizes early-successional habitat within a matrix of mature forest. The activity improves a forest stand of 10 acres in size.

Feature Measure: Area treated

Scenario Unit: Acres

Scenario Typical Size: 2.00

Scenario Total Cost: $1,831.96

Scenario Cost/Unit: $915.98

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	24	$151.20
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	24	$1,052.88
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	4	$445.80
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08

Practice: 666 - Forest Stand Improvement

Scenario: #9 - Tree Release, Light Equipment

Scenario Description:
A combination of mechanical hand and chemical treatments used to release young oak and mixed hardwood seedlings and saplings from unharvested overstory following a final harvest. The final harvest is not eligible for a program payment. Resource concerns include: - Inadequate structure and composition; - Undesirable plant productivity and health; and - Wildlife habitat degradation.

Before Situation:
Oak and mixed hardwood seedlings and saplings established naturally in a mature forest that was then commercially harvested. The desired seedlings and saplings are suppressed by trees left after the final harvest and vigorous woody brush that has over taken the newly-opened site.

After Situation:
After management, stand density, structure and composition are at an acceptable level. The young oak and mixed hardwood seedlings and saplings are growing at an acceptable rate without significant competition from other woody plants.

Feature Measure: Acres treated

Scenario Unit: Acres

Scenario Typical Size: 10.00

Scenario Total Cost: $3,068.48

Scenario Cost/Unit: $306.85

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	20	$126.00
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$81.82	10	$818.20
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	20	$877.40
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	6	$668.70
Materials						
Tree Marking Paint	313	Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only.	Acres	$12.39	5	$61.95
Herbicide, Triazine	1321	Broad spectrum herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$66.83	5	$334.15
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08

Practice: 666 - Forest Stand Improvement

Scenario: #10 - Uneven-aged Stand Marking, Commercial Harvest

Scenario Description:

Individual trees within a uneven-aged forest stand are marked for removal by a professional forester, in accordance with recommendations in an approved Forest Management Plan, to improve the health, productivity, composition and/or structure of the stand, to improve wildlife habitat, reduce wildfire hazard, and/or address concerns for soil erosion and water quality. The cost for this scenario is based on the labor for a professional forester to provide timber marking to ensure that the treatment is silviculturally sound, damage to the residual stand is minimized, and implementation accomplishes the desired improvements for resource concerns. Costs for removing undesirable trees are not included, as this will be accomplished through a commercial operation. NOTE: payment for this tree marking scenario cannot be made until the conservation activity (tree removal) has been properly installed and certified. Resource concerns include: Degraded Plant Condition - Undesirable plant productivity and health, Inadequate structure and composition, and Wildfire Hazard, Excessive Biomass Accumulation; Soil Erosion - Concentrated flow erosion, Ephemeral gully erosion, and Classic gully erosion; Fish and Wildlife - Inadequate Habitat - Cover/Shelter, and Food; and, Water Quality - Excessive sediment in surface waters.

Before Situation:

A forest stand is excessively dense (overstocked) and/or lacks desired attributes of species composition, structure, and/or health, and may have additional soil and water resource concerns. Wildlife habitat may lack desired tree species composition, structure, and/or understory vegetative conditions. There is a likelihood that trees could be cut and removed without the benefit of professional assistance, resulting in resource damage.

After Situation:

The stand has been marked by a professional forester to ensure a sustainable condition, and the trees have been removed by a commercial logger, according to the practice standard. The stocking is adjusted to an appropriate level, the species composition is better suited to wildlife, and the stand is more productive and healthier.

Feature Measure: <Unknown>

Scenario Unit: Acres

Scenario Typical Size: 10.00

Scenario Total Cost: $1,622.25

Scenario Cost/Unit: $162.23

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	14	$1,560.30
Materials						
Tree Marking Paint	313	Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only.	Acres	$12.39	5	$61.95

Practice: 666 - Forest Stand Improvement

Scenario: #11 - Even-aged Stand Marking, Commercial Harvest

Scenario Description:

Rows of a plantation or boundaries of a clearcut area within a even-aged forest stand are marked for removal by a professional forester, in accordance with recommendations in an approved Forest Management Plan, to improve the health, productivity, composition and/or structure of the stand, to improve wildlife habitat, reduce wildfire hazard, and/or address concerns for soil erosion and water quality. The cost for this scenario is based on the labor for a professional forester to provide timber marking to ensure that the treatment is silviculturally sound, damage to the residual stand is minimized, and implementation accomplishes the desired improvements for resource concerns. Costs for removing undesirable trees are not included, as this will be accomplished through a commercial operation. NOTE: payment for this tree marking scenario cannot be made until the conservation activity (tree removal) has been properly installed and certified. Resource concerns include: Degraded Plant Condition - Undesirable plant productivity and health, Inadequate structure and composition, and Wildfire Hazard, Excessive Biomass Accumulation; Soil Erosion - Concentrated flow erosion, Ephemeral gully erosion, and Classic gully erosion; Fish and Wildlife - Inadequate Habitat - Cover/Shelter, and Food; and, Water Quality - Excessive sediment in surface waters.

Before Situation:

A forest stand is excessively dense (overstocked) and/or lacks desired attributes of species composition, structure, and/or health, and may have additional soil and water resource concerns. Wildlife habitat may lack desired tree species composition, structure, and/or understory vegetative conditions. There is a likelihood that trees could be cut and removed without the benefit of professional assistance, resulting in resource damage.

After Situation:

The stand has been marked by a professional forester to ensure a sustainable condition, and the trees have been removed by a commercial logger, according to the practice standard. The stocking is adjusted to an appropriate level, the species composition is better suited to wildlife, and the stand is more productive and healthier.

Feature Measure: <Unknown>

Scenario Unit: Acres

Scenario Typical Size: 10.00

Scenario Total Cost: $842.10

Scenario Cost/Unit: $84.21

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	7	$780.15
Materials						
Tree Marking Paint	313	Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only.	Acres	$12.39	5	$61.95

Practice: 666 - Forest Stand Improvement

Scenario: #63 - Single Stem, Chemical Treatment

Scenario Description:

Altering the composition and stocking of a stand of trees by treating individual stems. The trees to be retained are marked by a consultant forester. The undesirable trees are killed using single-stem treatments such as injection or basal bark spraying. This scenario is used when the species and/or condition of trees makes it infeasible to use a commercial operation to remove them from the site. Resource concerns include:Degraded Plant Condition - Undesirable plant productivity and health, Inadequate structure and composition, and Wildfire Hazard, Excessive Biomass Accumulation;Soil Erosion - Concentrated flow erosion, Ephemeral gully erosion, and Classic gully erosion; Fish and Wildlife - Inadequate Habitat - Cover/Shelter, and Food; and, Water Quality - Excessive sediment in surface waters.

Before Situation:

The existing stand is composed of undesirable woody species and stocking exceeds the recommended levels for healthy growth. Stand and canopy density shades out understory shrubs and herbaceous plants, reducing food and cover for wildlife, and allowing soil erosion to occur due to the lack of herbaceous vegetation to slow runoff. Stand density compromises eco-site productivity and landscape hydrologic functions. Stand density compromises tree health and increases susceptibility to unacceptable outbreaks of insects and diseases, and creates catastrophic wild-land fire risk conditions that may threaten landscape health and function.

After Situation:

After management, stand density, structure and composition are at an acceptable level. Canopy gaps allow increased sunlight and air movement; understory plant growth, condition and quality are improved. Habitat for wildlife is improved, and soil erosion is limited. Stand density enhances eco-site diversity, and landscape hydrologic functions are improved. Trees are healthy and less susceptible to damaging levels of insect pests and diseases. The risk from catastrophic wild-land fire is reduced.

Feature Measure: Acres treated

Scenario Unit: Acres

Scenario Typical Size: 10.00

Scenario Total Cost: $4,083.79

Scenario Cost/Unit: $408.38

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	3	$76.08
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$81.82	20	$1,636.40
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	18	$2,006.10
Materials						
Tree Marking Paint	313	Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only.	Acres	$12.39	7	$86.73
Herbicide, Picloram	337	Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$19.28	5	$96.40
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08

Practice: 666 - Forest Stand Improvement

Scenario: #64 - Heavy Equipment, Mechanical Treatment

Scenario Description:
Using equipment such as a masticator or mulcher to mechanically control vegetation that competes with desirable trees and/or species, or to reduce the density of a stand of desirable trees. The trees to be retained will be marked by a forester. Resource concerns include: - Undesirable plant productivity and health; - Wildlife habitat degradation; - Wildfire hazard; and - Inadequate structure and composition.

Before Situation:
A stand of desirable trees is adversely affected by competition from undesirable species and/or trees, or because the stand is excessively dense. The vegetation to be controlled is too large to be mowed and requires mechanized equipment such as masticators or mulchers.

After Situation:
The released stand of trees has a composition and structure that satisfies landowners' objectives and addresses the resource concerns.

Feature Measure: Area treated

Scenario Unit: Acres

Scenario Typical Size: 10.00

Scenario Total Cost: $7,146.98

Scenario Cost/Unit: $714.70

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Mechanical cutter, chopper	943	Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included.	Hours	$116.89	30	$3,506.70
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	30	$1,203.90
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	15	$1,671.75
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: 666 - Forest Stand Improvement

Scenario: #65 - Thinning for Wildlife and Forest Health

Scenario Description:

Management to partially open a forest canopy to facilitate development of understory and midstory vegetation, and create conditions more favorable for desired wildlife species and tree health. A forester marks trees to be felled and/or treated. Treatment requires skilled labor using chainsaws and other hand tools, and chemical applications. Costs involved in any commercial harvest operation, including access and transportation costs, are not included in this scenario. Costs involved in marking trees to be treated, and supervising the treatment work, are included. Resource concerns include: - Inadequate structure and composition; - Undesirable plant productivity and health; and- Wildlife habitat degradation.

Before Situation:

The stand of mature trees is excessively dense, resulting in a closed canopy. The forest lacks midstory and horizontal structure, the herbaceous layer is lacking or in poor condition, and/or the desired and characteristic plant diversity for the eco-site is not present. Without management, the site will not reach the desired future condition and meet landowners' objectives for wildlife habitat and forest health.

After Situation:

After management, stand density, structure and composition are at an acceptable level. The canopy is opened to the extent necessary to promote herbaceous growth and mid-canopy development. Air movement, and understory plant growth, condition and quality are improved. Habitat for wildlife is improved. Stand density enhances eco-site diversity, Trees are healthy and less susceptible to damaging levels of insect pests and diseases.

Feature Measure: Acres treated

Scenario Unit: Acres

Scenario Typical Size: 10.00

Scenario Total Cost: $7,192.84

Scenario Cost/Unit: $719.28

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	40	$252.00
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$81.82	40	$3,272.80
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	5	$90.65
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	40	$1,754.80
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	10	$1,114.50
Materials						
Tree Marking Paint	313	Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only.	Acres	$12.39	5	$61.95
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.61	5	$8.05
Herbicide, Triazine	1321	Broad spectrum herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$66.83	5	$334.15
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: 670 - Energy Efficient Lighting System

Scenario: #2 - Lighting - Replace Existing Lighting Fixture with General or Low Bay Lighting

Scenario Description:

To install more energy efficient general or low bay lighting fixtures to replace existing less efficient lighting fixtures used to provide ambient lighting levels in indoor work areas. Associated materials for installation of replacement fixtures are included. Appropriate disposal of existing lamps, ballasts and other materials is required.

Before Situation:

An inefficient lighting system such as one using incandescent lamps has been identified by an on-farm energy audit.

After Situation:

More efficient lighting is provided in order to reduce energy use as evidenced by the energy audit. Some examples of general lighting fixtures include wall mounted LED wall pack fixtures, low intensity flood or ceiling mounted fixtures. Low bay lighting is typically used when ceilings are 20 feet or less in height. Low bay fixtures usually have diffuser mounted to the bottom of the fixture that serves to spread light over a large area. The typical fixture installed is a 50 watt light emitting diode (LED) with a 5000 Kelvin, 2,481 lumen flood lamp with an industrial grade fixture designed to withstand the environmental conditions where the system is installed. Associated practices/activities: CAP 128 AgEMP and 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a CAP 128 Ag EMP or a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Each lamp replaced

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $179.87

Scenario Cost/Unit: $179.87

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	1	$43.87
Materials						
Lighting, Fixture, Flood, LED, typically 4,000-8000 lumens, wet location	2601	Light emitting diode (LED) fixture, typical output of 4,000 - 8,000 lumens industrial grade with fixture; wet location; minimum 50,000 hour lifespan. Includes materials only.	Watt	$2.72	50	$136.00

Practice: 670 - Energy Efficient Lighting System

Scenario: #5 - Lighting - Replace Existing Lighting Fixture with Flood Lighting

Scenario Description:
To install flood lighting system to replace existing less efficient lighting fixtures. Associated materials for installation of replacement fixtures are included. Appropriate disposal of existing lamps, ballasts and other materials is required.

Before Situation:
An inefficient lighting system such as one using incandescent lamps has been identified by an on-farm energy audit.

After Situation:
More efficient lighting is provided in order to reduce energy use as evidenced by the energy audit. The typical fixture installed is a 100 watt light emitting diode (LED) with a 5700 Kelvin, 4,000 lumens flood lamp with an industrial grade fixture designed to withstand the environmental conditions where the system is installed. Associated practices/activities: CAP 128 AgEMP and 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a CAP 128 Ag EMP or a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Each lamp replaced

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $315.87

Scenario Cost/Unit: $315.87

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	1	$43.87
Materials						
Lighting, Fixture, Flood, LED, typically 4,000-8000 lumens, wet location	2601	Light emitting diode (LED) fixture, typical output of 4,000 - 8,000 lumens industrial grade with fixture; wet location; minimum 50,000 hour lifespan. Includes materials only.	Watt	$2.72	100	$272.00

Practice: 670 - Energy Efficient Lighting System

Scenario: #20 - Dairy Freestall Barn, High Bay Lighting, Fixtures Replacement

Scenario Description:

To install high bay lighting system to replace existing less efficient lighting fixtures. Associated materials for installation of replacement fixtures are included. Appropriate disposal of existing lamps, ballasts and other materials is required. Typical building size is 105 wide X 230 feet long. (Each fixture illuminates 805 square foot in the building) ASAE EP-344 is used for the Illuminance levels for the free stall barn. The area proposed to be illuminated is the unit of measure for payment.

Before Situation:

An inefficient lighting system such as one using mercury vapor lighting fixtures has been identified by an on-farm energy audit.

After Situation:

More efficient lighting is provided in order to reduce energy use as evidenced by the energy audit. High bay lighting is typically used when ceilings are 20 - 45 feet in height and where fixtures are mounted at the ceiling height instead of being suspended down to a lower level. High bay fixtures usually have an aluminum or mirror-like reflector which directs light downwards to the floor area or a prismatic reflector to spread light over larger areas. These are needed to ensure that the light reaches floor or working area level where it is needed. The typical fixture installed is a 150 watt light emitting diode (LED) with a 5000 Kelvin, 14,000 lumens lamp with an industrial grade fixture designed to withstand the environmental conditions where the system is installed. Associated practices/activities: CAP 128 AgEMP and 670-LIGHTING SYSTEM IMPROVEMENT. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a CAP 128 Ag EMP or a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Square foot of the area in the buildi

Scenario Unit: Square Feet

Scenario Typical Size: 24,150.00

Scenario Total Cost: $8,792.24

Scenario Cost/Unit: $0.36

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	62	$2,719.94
Materials						
Lighting, Fixture, High Bay, LED, 24,000 lumens, Damp Location	2602	LED High Bay Fixture, typically 5000 Kelvin bulb, 24,000 lumens; industrial grade with fixture; suitably protected from dirt accumulation, and damp locations. Minimum lifespan of 50,000 hours. Includes materials only.	Each	$202.41	30	$6,072.30

Practice: 670 - Energy Efficient Lighting System

Scenario: #21 - Poultry House Lighting

Scenario Description:

To install dimmable LEDs to replace less efficient lighting fixtures. Associated materials for installation of replacement fixtures are included. The typical area being lit is 50' x 400' and uses 50 fixtures. Typical fixtures are 18 Watt LED, 3700 Kelvin, dimmable, grow-out bulb; industrial grade; suitably protected from dirt accumulation. In high humidity environments or areas subject to wash down, gasketed or weatherproof housings are required to prevent corrosion and premature failure. Appropriate disposal of existing lamps, ballasts and other materials is required.

Before Situation:

An inefficient lighting system such as one using incandescent lamps has been identified by an on-farm energy audit.

After Situation:

More efficient lighting is provided by Light-Emitting Diode (LED) lamps in order to reduce energy use as evidenced by the energy audit. Associated practices/activities: 128-AgEMP and 670 Lighting System Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Square foot of the area in the buildi

Scenario Unit: Square Feet

Scenario Typical Size: 20,000.00

Scenario Total Cost: $2,362.32

Scenario Cost/Unit: $0.12

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	36	$1,579.32
Materials						
Lighting, LED Lamp, minimum 90 Lum/Watt, <= 20 watts	2599	LED lamp (bulb) rated for damp locations, dimmable. Includes Materials only.	Watt	$0.87	900	$783.00

Practice: 670 - Energy Efficient Lighting System

Scenario: #30 - Automatic Controller System

Scenario Description:

The typical scenario consists of an automatic control system installed on an existing manually controlled agricultural system. Typical components may include any of the following: wiring, sensors, data logger, logic controller, communication link, software, switches, and relay.

Before Situation:

A manually controlled system is existing in an agricultural facility that causes the inefficient use of energy, as evidenced by an on-farm energy audit.

After Situation:

An on-farm energy audit has determined that energy use can be reduced through use of an automatic controller that helps regulates the energy consumption of the existing system. Associated practices/activities may include: 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Each system

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $537.26

Scenario Cost/Unit: $537.26

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	4	$175.48
Materials						
Programable LED Dimmer	2720	Programable light dimmer/controller for poultry and hog barns - Includes material and shipping only	Each	$361.78	1	$361.78

Practice: 670 - Energy Efficient Lighting System

Scenario: #33 - Swine Facility Lighting

Scenario Description:

To install dimmable LEDs to replace less efficient lighting fixtures. Associated materials for installation of replacement fixtures are included. The areas where more efficient lighting is being installed include a mixture of gestation, nursery, farrowing and finishing facilities. Typical fixtures are 25 Watt LED dimmable, grow-out bulb; industrial grade; suitably protected from dirt accumulation. In high humidity environments or areas subject to wash down, gasketed or weatherproof housings are required to prevent corrosion and premature failure. Appropriate disposal of existing lamps, ballasts and other materials is required.

Before Situation:

An inefficient lighting system such as one using incandescent lamps has been identified by an on-farm energy audit.

After Situation:

More efficient lighting is provided by Light-Emitting Diode (LED) lamps in order to reduce energy use as evidenced by the energy audit. Associated practices/activities: 128-AgEMP and 670 Lighting System Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Square foot of the area in the buildi

Scenario Unit: Square Feet

Scenario Typical Size: 29,630.00

Scenario Total Cost: $5,041.27

Scenario Cost/Unit: $0.17

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	46	$2,018.02
Materials						
Lighting, LED Lamp, minimum 90 Lum/Watt, <= 20 watts	2599	LED lamp (bulb) rated for damp locations, dimmable. Includes Materials only.	Watt	$0.87	3475	$3,023.25

Practice: 672 - Energy Efficient Building Envelope

Scenario: #3 - Building Envelope - Sealant

Scenario Description:

A typical scenario is sealing the gaps between walls, gables, ceiling, etc. in an agricultural or livestock building or a greenhouse. Sealing is performed by a professional contractor, not merely use of spray foam from a can. The unit basis of payment in this scenario is each house based on 60' x 500' poultry house with an assumed need of sealant to seal 2400 linear feet of gap.

Before Situation:

An agricultural facility with an inefficient building envelope with gaps between walls, ceiling, etc. for a total of 2400 linear feet.

After Situation:

A more effective and efficient building envelope can be created through interior sealing of the exterior walls at the footer plate, eaves, ridge cap, and gable ends. The sealant reduces seasonal heat loss and heat gain due to infiltration which reduces the respective need for heating and cooling equipment to operate. Associated practices/activities: CAP 128 AgEMP and 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a CAP 128 Ag EMP or a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Perimeter of heated structure

Scenario Unit: Feet

Scenario Typical Size: 2,400.00

Scenario Total Cost: $4,800.00

Scenario Cost/Unit: $2.00

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Sealant	1150	Greenhouse and building gap sealant. Performed by a professional contractor spraying the areas with an approved sealant for poultry production facilities. Includes materials, equipment and labor to install.	Feet	$2.00	2400	$4,800.00

Practice: 672 - Energy Efficient Building Envelope

Scenario: #49 - Building Envelope - Mechanical Screens

Scenario Description:

The mechanical energy screen system consists of a drive motor, support cables, controls, and shade material, which may be woven, knitted, or non-woven strips of aluminum fiber, polyethylene, nylon or other synthetic material. The screen provides a means to better control solar heat gain and heat transfer during night or cold weather conditions to reduce energy use. Screens and similar devices may also be used to divide internal areas and allow for differentiated heating, ventilation, or cooling system operation to reduce energy use.

Before Situation:

Heating and cooling of an existing greenhouse, or similar structure with conditioned spaces, is inefficient due to poorly regulated heat transfer. A need to regulate an entire space for uniform conditions when some portions have differing, intermittent requirements can also reduce efficiency.

After Situation:

The greenhouse is fitted with a mechanically controlled energy screen installed truss-to-truss or gutter-to-gutter, with side screens as necessary, reducing heat loss in the greenhouse. Associated practices/activities: CAP 128 AgEMP and 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a CAP 128 Ag EMP or a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Area of Screen

Scenario Unit: Square Feet

Scenario Typical Size: 25,000.00

Scenario Total Cost: $77,201.92

Scenario Cost/Unit: $3.09

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	16	$701.92
Materials						
Thermal blanket 10,001 - 50,000 square foot	1148	Thermal blanket greenhouse screens: mechanical energy screen system consists of a drive motor, support cables, controls, and shade material, which may be woven, knitted, or non-woven. Size Range is 10,001 to 50,000 square feet. Materials only.	Square Feet	$3.06	25000	$76,500.00

Practice: 672 - Energy Efficient Building Envelope

Scenario: #75 - Building Envelope - Attic Insulation

Scenario Description:
Install a minimum R-7 insulation in addition to existing attic or ceiling to reduce heat transfer. Increased insulation reduces seasonal heat loss and heat gain which reduces the respective need for heating and cooling equipment to operate.

Before Situation:
A poultry house with an inefficient building envelope with limited attic insulation.

After Situation:
A more effective and efficient building envelope can be created through addition of, or increased, attic insulation. Associated practices/activities: 122-AgEMP - HQ and 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Area of Attic Insulated

Scenario Unit: Square Feet

Scenario Typical Size: 20,000.00

Scenario Total Cost: $20,600.00

Scenario Cost/Unit: $1.03

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Insulation, Fiberglass or cellulose, R-15	1196	Fiberglass or cellulose insulation R-15, includes materials, equipment and labor to install.	Square Feet	$1.03	20000	$20,600.00

Practice: 672 - Energy Efficient Building Envelope

Scenario: #76 - Building Envelope - Wall Insulation

Scenario Description:

Install insulation in uninsulated or underinsulated mechanically ventilated agricultural barns with a metal exterior with the use of fiberglass batts or spray polyurethane foam that includes a thermal barrier. The R-rating of the wall assembly must meet the requirements for the location. Option 1: Fiberglass batts (typically 3.5??? and R-11), vapor barrier and interior plywood or OSB sheathing that meets thermal barrier requirements. Option 2) Use a closed cell polyurethane foam (typically 1??? thick (R value 5-7) in accordance with manufacturer???s recommendation, a thermal barrier (typically ????? plywood or OSB), and vapor barrier if required. Thermal barriers exposed to animals shall protect the insulation or from animal destruction (such as peck boards for the bottom 2 feet of poultry houses).

Before Situation:

A mechanically ventilated agriculture barn with an inefficient building envelope with limited wall insulation.

After Situation:

A more effective and efficient building envelope can be created through addition of, or increased, insulation. Associated practices/activities: may include 128-Agricultural Energy Management Plan and 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Area of Attic Insulated

Scenario Unit: Square Feet

Scenario Typical Size: 4,500.00

Scenario Total Cost: $12,195.00

Scenario Cost/Unit: $2.71

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Materials						
Insulation, Panel, R-11 with sheathing	1197	Insulated wall panel typically 3.5 inch fiberglass batts (R-11), vapor barrier and OSB sheathing, or equal, includes materials, equipment and labor to install.	Square Feet	$2.71	4500	$12,195.00

Practice: 672 - Energy Efficient Building Envelope

Scenario: #77 - Greenhouse - Insulate Unglazed Walls

Scenario Description:
A typical scenario is the installation insulation in green house to address energy loss. The insulation can be either of the cellouse or bubble type (or equivalent). The increased insulation reduces seasonal heat loss and heat gain which reduces the respective need for heating and cooling equipment to operate.

Before Situation:
Green house with standard glazing, plastic or polycarbonate walls and no insulation. Heating and cooling of an existing greenhouse is inefficient due to excessive heat loss.

After Situation:
The greenhouse is fitted with insulation installed truss-to-truss or gutter-to-gutter and/or non glazed endwalls and/or sidewalls, reducing heat loss and gain in the greenhouse. Associated practices/activities: may include 122-AgEMP - HQ and 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Square Feet of insulation

Scenario Unit: Square Feet

Scenario Typical Size: 25,000.00

Scenario Total Cost: $10,451.92

Scenario Cost/Unit: $0.42

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	16	$701.92
Materials						
Insulation, Greenhouse, Reflective Bubble	2410	Double bubble reflective insulation with aluminum foil on both sides. Includes materials and shipping only.	Square Feet	$0.39	25000	$9,750.00

Practice: 672 - Energy Efficient Building Envelope

Scenario: #79 - Insulated Roll-Up Door

Scenario Description:
A typical scenario is the replacement of non-insulated rollup doors in livestock houses or greenhouses with insulated rollup doors. The increased insulation reduces seasonal heat loss and heat gain which reduces the respective need for heating and cooling equipment to operate.

Before Situation:
A livestock house or greenhouse has non-insulated or inefficiently insulated rollup doors causing high heat loss or gain.

After Situation:
A more effective and efficient energy seal can be created through the addition of, or increased R-value, insulated rollup doors. Associated practices/activities: may include 128-AgEMP, 672-Building Envelope Improvement, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a CAP 128 AgEMP or Type 2 energy audit meeting the requirements of ASABE S612.

Feature Measure: Each Door

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $1,756.35

Scenario Cost/Unit: $1,756.35

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	5	$143.55
Materials						
Door, Insulated, Roll-up	2392	Rolling service insulated steel door, 20 gauge. Includes hardware required to install. Used to replace non insulated door in buildings. Materials only.	Square Feet	$10.08	160	$1,612.80

Practice: 782 - Phosphorus Removal System

Scenario: #3 - Tile discharge, in-ground tank

Scenario Description:
Treating tile drain outflow or surface runoff through a filter media that is contained in a concrete vessel to remove phosphorus. The resource concern is phosphorus leaving farm fields via direct discharge from tile drains to receiving waters contributing to eutrophication.

Before Situation:
Tile drain or surface runoff discharge to the edge of fields or into drainage ditches

After Situation:
The practice will be an in-ground tank containing filter media. Tile discharge will enter upstream end and exit downstream end of tank. Appropriate piping will be installed to transfer tile discharge to the tank and to transfer flow exiting tank to same receiving water as before installation.

Feature Measure: Number of Systems Installed

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $10,194.21

Scenario Cost/Unit: $10,194.21

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hydraulic Excavator, .5 CY	930	Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included.	Hours	$101.18	8	$809.44
Aggregate, Wood Chips	1098	Includes materials, equipment and labor to transport and place.	Cubic Yards	$50.92	5	$254.60
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	8	$242.88
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	20	$2,229.00
Materials						
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	3	$91.08
Tank, Concrete, 2500 gallon	1055	Concrete tank for water storage, with riser and lid. Includes materials and delivery.	Each	$3,334.76	1	$3,334.76
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.29	50	$114.50
Aggregate, gravel, washed, pea gravel	1331	Washed and graded pea gravel river stone. Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$32.50	5	$162.50
Water Control Structure, Stoplog, Inline, fixed costs portion	2145	Fixed cost portion of Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Materials only.	Each	$367.01	2	$734.02
Water Control Structure, Stoplog, Inline, variable cost portion	2146	Variable cost portion of a Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Calculate total variable costs by multiplying by the structure height x pipe diameter. Materials only.	Height x Diameter	$18.68	60	$1,120.80
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Aggregate, Shipping, Cubic Yard-mile	2360	Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul).	Cubic Yard Mile	$0.42	800	$336.00

Practice: 782 - Phosphorus Removal System

Scenario: #4 - In-Ditch Filter

Scenario Description:
Treating tile drain water or surface runoff in a open ditch through a filter to remove phosphorus. The resource concern is phosphorus leaving farm fields via direct discharge from tile drains to receiving waters contributing to eutrophication.

Before Situation:
Tile drain or surface runoff discharge to the edge of fields into drainage ditches

After Situation:
The practice will be a ditch lined with filter media. Tile discharge will enter upstream end and exit downstream end of media.

Feature Measure: Number is Systems Installed

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $5,943.31

Scenario Cost/Unit: $5,943.31

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hydraulic Excavator, .5 CY	930	Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included.	Hours	$101.18	8	$809.44
Aggregate, Wood Chips	1098	Includes materials, equipment and labor to transport and place.	Cubic Yards	$50.92	8	$407.36
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	8	$242.88
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	20	$2,229.00
Materials						
Aggregate, gravel, washed, pea gravel	1331	Washed and graded pea gravel river stone. Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$32.50	20	$650.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Aggregate, Shipping, Cubic Yard-mile	2360	Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul).	Cubic Yard Mile	$0.42	2000	$840.00

Practice: 782 - Phosphorus Removal System

Scenario: #8 - Tile Discharge, in-ground earthen chamber

Scenario Description:
Treating tile drain outflow or surface runoff through a filter media that is contained in an earthen chamber to remove phosphorus. The resource concern is phosphorus leaving farm fields via direct discharge from tile drains to receiving waters contributing to eutrophication.

Before Situation:
Tile drain or surface runoff discharge to the edge of fields or into drainage ditches.

After Situation:
The practice will be an in-ground earthen chamber containing filter media. Tile discharge will enter upstream end and exit downstream end of earthen chamber. Appropriate piping will be installed to transfer tile discharge to the earthen chamber and to transfer flow exiting near to same receiving water as before installation.

Feature Measure: Number of Systems Installed

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $6,768.37

Scenario Cost/Unit: $6,768.37

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hydraulic Excavator, .5 CY	930	Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included.	Hours	$101.18	8	$809.44
Aggregate, Wood Chips	1098	Includes materials, equipment and labor to transport and place.	Cubic Yards	$50.92	5	$254.60
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	8	$242.88
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	20	$2,229.00
Materials						
Pipe, PVC, dia. < 18 in., weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18 inch. Materials only.	Pound	$2.29	50	$114.50
Aggregate, gravel, washed, pea gravel	1331	Washed and graded pea gravel river stone. Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$32.50	5	$162.50
Water Control Structure, Stoplog, Inline, fixed costs portion	2145	Fixed cost portion of Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Materials only.	Each	$367.01	2	$734.02
Water Control Structure, Stoplog, Inline, variable cost portion	2146	Variable cost portion of a Water Level Control Structure, Inline stoplog type. Typically made of PVC or fiberglass materials. Calculate total variable costs by multiplying by the structure height x pipe diameter. Materials only.	Height x Diameter	$18.68	60	$1,120.80
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63
Aggregate, Shipping, Cubic Yard-mile	2360	Mobilization of aggregate material beyond 20 miles of local delivery from quarry to construction site. Cubic Yard-mile (Cubic Yard * miles of haul).	Cubic Yard Mile	$0.42	800	$336.00

Practice: 805 - Amending Soil Properties with Lime

Scenario: #33 - Market/Gardens

Scenario Description:
Market/Garden production is impacted by Soil pH. Lime will be applied according to soil test recommendations to improve the soil physical, chemical, and biological properties.

Before Situation:
Producer has not used lime and as a result the soil pH is acidic and resulting in decrease in plant available nutrients, poor soil structure, soil health is reduced and poor crop production.

After Situation:
Plant productivity and heath is improved due to a increase in availability for applied nutrient and less nutrients being lost. Soil structure & Health will improve resulting improved water infiltration and less runoff.

Feature Measure: 1,000 square foot

Scenario Unit: 1,000 Square Foot

Scenario Typical Size: 15.00

Scenario Total Cost: $200.66

Scenario Cost/Unit: $13.38

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$9.23	0.34	$3.14
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	3	$86.13
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	2	$97.20
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$14.19	1	$14.19

Practice: 805 - Amending Soil Properties with Lime

Scenario: #34 - Low Rate Lime <= 2.0 Ton

Scenario Description:
Crop production is impacted by Soil pH. Lime will be applied based on cropping system and according to soil test recommendations to improve the soil physical, chemical, and biological properties.

Before Situation:
Producer has not used lime and as a result the soil pH is acidic and resulting in decrease in plant available nutrients, poor soil structure, soil health is reduced and poor crop production.

After Situation:
Plant productivity and heath is improved due to a increase in availability for applied nutrient and less nutrients being lost. Soil structure & Health will improve resulting improved water infiltration and less runoff.

Feature Measure: Acres

Scenario Unit: Acres

Scenario Typical Size: 40.00

Scenario Total Cost: $786.38

Scenario Cost/Unit: $19.66

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$9.23	40	$369.20
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	8	$388.80
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$14.19	2	$28.38

Practice: 805 - Amending Soil Properties with Lime

Scenario: #35 - Lime Rate > 2.0 Ton

Scenario Description:
Biogeochemical function of the soil is impacted by Soil pH. Lime will be applied based on cropping system and according to soil test recommendations to improve the soil physical, chemical, and biological properties.

Before Situation:
Producer has not used lime and as a result the soil pH is acidic and resulting in decrease in plant available nutrients, poor soil structure, soil health is reduced and poor crop production.

After Situation:
Implementation according to the plans and specification has occurred. Plant productivity and heath is improved due to a increase in availability for applied nutrient and less nutrients being lost. Soil structure and health will improve resulting improved water infiltration and less runoff.

Feature Measure: Acres treated

Scenario Unit: Acres

Scenario Typical Size: 40.00

Scenario Total Cost: $1,349.98

Scenario Cost/Unit: $33.75

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$9.23	80	$738.40
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	12	$583.20
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$14.19	2	$28.38

Practice: 810 - Annual Forages for Grazing Systems

Scenario: #25 - Annual forages mix

Scenario Description:

Seeding crop, pasture or grazing land to multi-species mix of annual grasses, legumes, forbs or similar species. This mix will address all the planned purposes of the Annual Forages for Grazing Systems (810) standard. Plant forage immediately after harvest of a row crop, small grain, or other forage. Seeding equipment typically used is available on-site. When applicable, terminate the annual forage using an approved method prior to planting a subsequent crop per the NRCS Cover Crop Termination.

Before Situation:

Existing forage stands do not meet the forage demands and or quality for grazing animals, particularly during periods of low forage production. Resource concerns include undesirable plant productivity and health, inadequate feed and forage for livestock, soil erosion, and soil quality. In cases where poor quality or low yields exist in current annual pasture, annual forages replace the existing undesirable forage species and provides temporary forage and erosion control. This payment scenario is based on the no-till drilling of annual forages with no chemical applications.

After Situation:

Established annual forage mix improved livestock nutrition through improved forage quality and quantity, reduced erosion and improved soil condition. Over time, soil health is improved due to the additional biomass, ground cover, soil infiltration, and plant diversity introduced to the cropping or pasture system.

Feature Measure: acres of annual forages planted

Scenario Unit: Acres

Scenario Typical Size: 20.00

Scenario Total Cost: $1,959.70

Scenario Cost/Unit: $97.99

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	20	$445.40
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	10	$287.10
Materials						
Annual Grasses, Legumes or Forbs	2732	A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$61.36	20	$1,227.20

Practice: 812 - Raised Beds

Scenario: #71 - Unframed Raised Bed field size < 0.10 acres Contamination or Debris Sites only

Scenario Description:
The soil at this site has characteristics that restrict the ability to grow food and fiber crops directly in the soil. The soil has heavy metal contaminants and/or buried debris from past activities on the site. The owner/operator desires to bring the site into agricultural production. Typical size of raised bed is 4ft x 16 ft and minimum 16 inches deep and less than 100 sq ft. Field size 0.10 Acres (4356 sq ft) or less.

Before Situation:
Soils on site are unsuitable for agricultural production. Soil cannot be be remediated or debris cannot be removed practically.

After Situation:
Raised beds or mounds are created above the existing soil. Geomembrane may be used to separate plant roots from contacting soil contaminants. Raised beds are designed to meet the owner/operator objectives for overall size. Associated practices may include Trails and Walkways (575), Critical Area Planting (342).

Feature Measure: square feet of bed

Scenario Unit: Square Feet

Scenario Typical Size: 85.00

Scenario Total Cost: $438.99

Scenario Cost/Unit: $5.16

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.45	3	$10.35
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	2	$50.72
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	4	$175.48
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	4	$114.84
Materials						
Geotextile, non-woven, light weight	1209	Non-woven less than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	$2.08	12	$24.96
Earthfill Material, purchased, topsoil	2745	Purchased topsoil or screened loam. Material only.	Cubic Yards	$20.88	3	$62.64

Practice: 812 - Raised Beds

Scenario: #72 - Unframed Raised Bedfield size < 0.5 acres Contamination or Debris Sites only

Scenario Description:
The soil at this site has characteristics that restrict the ability to grow food and fiber crops directly in the soil. The soil has heavy metal contaminants and/or buried debris from past activities on the site. The owner/operator desires to bring the site into agricultural production. Bed area is 100 to 500 square feet. Raised bed size and shape varies. Field size up to 0.5 acres. NOT TO BE USED FOR RIDGE TILLAGE.

Before Situation:
Soils on site are unsuitable for agricultural production. Soil cannot be be remediated or debris cannot be removed practically.

After Situation:
Raised beds or mounds are created above the existing soil. Geomembrane may be used to separate plant roots from contacting soil contaminants. Raised beds are designed to meet the owner/operator objectives for overall size. Associated practices may include Trails and Walkways (575), Critical Area Planting (342).

Feature Measure: square feet per bed

Scenario Unit: Square Feet

Scenario Typical Size: 300.00

Scenario Total Cost: $1,086.82

Scenario Cost/Unit: $3.62

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.45	22	$75.90
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	2	$50.72
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	4	$175.48
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Materials						
Geotextile, non-woven, light weight	1209	Non-woven less than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	$2.08	46	$95.68
Earthfill Material, purchased, topsoil	2745	Purchased topsoil or screened loam. Material only.	Cubic Yards	$20.88	22	$459.36

Practice: 812 - Raised Beds

Scenario: #73 - Framed Raised Bed Small Lot Contamination or Debris Sites only

Scenario Description:
The soil at this site has characteristics that restrict the ability to grow food and fiber crops directly in the soil. The soil has heavy metal contaminants and/or buried debris from past activities on the site. The owner/operator desires to bring the site into agricultural production. Typical size of raised bed 4ft x 16 ft less than or equal to 100 sq ft. Field size 0.10 Acres or less.

Before Situation:
Soils on site are unsuitable for agricultural production. Soil cannot be be remediated or debris cannot be removed practically.

After Situation:
Raised beds or mounds are created above the existing soil. Geomembrane may be used to separate plant roots from contacting soil contaminants. Raised beds are designed to meet the owner/operator objectives for overall size. Associated practices may include Trails and Walkways (575), Critical Area Planting (342).

Feature Measure: sq ft

Scenario Unit: Square Feet

Scenario Typical Size: 64.00

Scenario Total Cost: $958.55

Scenario Cost/Unit: $14.98

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.45	3	$10.35
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	2	$50.72
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	4	$175.48
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	4	$114.84
Materials						
Geotextile, non-woven, light weight	1209	Non-woven less than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	$2.08	9	$18.72
Lumber, planks, posts and timbers, untreated, rot resistant	1612	Untreated dimension lumber with nominal thickness greater than 2 inches, milled from rot resistant species such as cedar. Includes lumber and fasteners. Does not include labor.	Board Feet	$4.84	108	$522.72
Steel, Structural Braces and Supports	2497	Structural steel in various sizes and shapes. Includes materials and shipping only.	Pound	$1.54	2	$3.08
Earthfill Material, purchased, topsoil	2745	Purchased topsoil or screened loam. Material only.	Cubic Yards	$20.88	3	$62.64

Practice: 812 - Raised Beds

Scenario: #74 - Framed Raised Bed < 500 sq ft Contamination or Debris Sites only

Scenario Description:
The soil at this site has characteristics that restrict the ability to grow food and fiber crops directly in the soil. The soil has heavy metal contaminants and/or buried debris from past activities on the site. The owner/operator desires to bring the site into agricultural production. Typical size of raised bed ranges from100 square feet to 500 square feet. Field size 0.10 Acres or less.

Before Situation:
Soils on site are unsuitable for agricultural production. Soil cannot be be remediated or debris cannot be removed practically.

After Situation:
Raised beds or mounds are created above the existing soil. Geomembrane may be used to separate plant roots from contacting soil contaminants. Raised beds are designed to meet the owner/operator objectives for overall size. Associated practices may include Trails and Walkways (575), Critical Area Planting (342).

Feature Measure: sq ft

Scenario Unit: Square Feet

Scenario Typical Size: 200.00

Scenario Total Cost: $1,583.06

Scenario Cost/Unit: $7.92

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.45	10	$34.50
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	2	$50.72
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	8	$350.96
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	4	$114.84
Materials						
Geotextile, non-woven, light weight	1209	Non-woven less than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	$2.08	22	$45.76
Lumber, planks, posts and timbers, untreated, rot resistant	1612	Untreated dimension lumber with nominal thickness greater than 2 inches, milled from rot resistant species such as cedar. Includes lumber and fasteners. Does not include labor.	Board Feet	$4.84	160	$774.40
Steel, Structural Braces and Supports	2497	Structural steel in various sizes and shapes. Includes materials and shipping only.	Pound	$1.54	2	$3.08
Earthfill Material, purchased, topsoil	2745	Purchased topsoil or screened loam. Material only.	Cubic Yards	$20.88	10	$208.80

Practice: 812 - Raised Beds

Scenario: #76 - Framed Raised Bed greater than or equal to 500 sq ft Contamination or Debris Sites only

Scenario Description:
The soil at this site has characteristics that restrict the ability to grow food and fiber crops directly in the soil. The soil has heavy metal contaminants and/or buried debris from past activities on the site. The owner/operator desires to bring the site into agricultural production. Typical size of raised bed ranges from 500 square feet to 2000 square feet. Scenario assumes 16*50 ft bed size.

Before Situation:
Soils on site are unsuitable for agricultural production. Soil cannot be be remediated or debris cannot be removed practically.

After Situation:
Raised beds or mounds are created above the existing soil. Geomembrane may be used to separate plant roots from contacting soil contaminants. Raised beds are designed to meet the owner/operator objectives for overall size. Associated practices may include Trails and Walkways (575), Critical Area Planting (342).

Feature Measure: sq ft

Scenario Unit: Square Feet

Scenario Typical Size: 800.00

Scenario Total Cost: $3,611.09

Scenario Cost/Unit: $4.51

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic Yards	$3.45	40	$138.00
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	4	$101.44
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	12	$526.44
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Materials						
Geotextile, non-woven, light weight	1209	Non-woven less than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	$2.08	35	$72.80
Lumber, planks, posts and timbers, untreated, rot resistant	1612	Untreated dimension lumber with nominal thickness greater than 2 inches, milled from rot resistant species such as cedar. Includes lumber and fasteners. Does not include labor.	Board Feet	$4.84	352	$1,703.68
Steel, Structural Braces and Supports	2497	Structural steel in various sizes and shapes. Includes materials and shipping only.	Pound	$1.54	2.5	$3.85
Earthfill Material, purchased, topsoil	2745	Purchased topsoil or screened loam. Material only.	Cubic Yards	$20.88	40	$835.20

Practice: 815 - Groundwater Recharge Basin or Trench

Scenario: #13 - Recharge Basin < 10 ac-ft storage

Scenario Description:

This scenario includes a constructed basin for the sole purpose to recharge an unconfined aquifer. A typical recharge basin has a 3 acre surface area, 8 feet water depth, and 8 acre-feet storage capacity. Resource concerns: Source Water Depletion - Groundwater depletion. Associated practices: Irrigation Pipeline (430); Pumping Plant (533); Structure for Water Control (587); Mulching (484); Critical Area Planting (342).

Before Situation:

The current system lacks an impoundment with a permeable base to collect and store surface water or stormwater runoff.

After Situation:

An excavated basin is constructed to recharge groundwater without negatively impacting groundwater quality, onsite or nearby land uses, and sensitive habitats. When either surface water or storm water runoff is available for recharge, the basin is filled and the contained water percolates into the ground.

Feature Measure: Volume of earth excavated

Scenario Unit: Acre Feet

Scenario Typical Size: 8.00

Scenario Total Cost: $44,248.34

Scenario Cost/Unit: $5,531.04

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	12907	$32,525.64
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$100.26	60	$6,015.60
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	66	$2,648.58
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	4	$3,058.52

Practice: 815 - Groundwater Recharge Basin or Trench

Scenario: #14 - Recharge Basin >= 10 ac-ft storage

Scenario Description:

This scenario includes a constructed basin for the sole purpose to recharge an unconfined aquifer. A typical recharge basin has a 5 acre surface area, 8 feet water depth, and with an 13 acre feet storage capacity. Resource concerns: Source Water Depletion - Groundwater depletion. Associated practices: Irrigation Pipeline (430); Pumping Plant (533); Structure for Water Control (587); Mulching (484); Critical Area Planting (342).

Before Situation:

The current system lacks an impoundment with a permeable base structure to collect and store surface water or stormwater runoff.

After Situation:

An excavated basin is constructed to recharge groundwater without negatively impacting groundwater quality, onsite or nearby land uses, and sensitive habitats. When either surface water or storm water runoff is available for recharge, the basin is filled and the contained water percolates into the ground.

Feature Measure: Volume of earth excavated

Scenario Unit: Acre Feet

Scenario Typical Size: 13.00

Scenario Total Cost: $67,462.72

Scenario Cost/Unit: $5,189.44

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	20973	$52,851.96
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$100.26	80	$8,020.80
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	88	$3,531.44
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	4	$3,058.52

Practice: 815 - Groundwater Recharge Basin or Trench

Scenario: #15 - Excavated Recharge Trench

Scenario Description:
Scenario includes an excavated trench (ditch) within cropland or immediately adjacent to cropland to recharge an unconfined aquifer. Surface flows may naturally flow or be directed to the trench. A typical groundwater recharge trench has dimensions of 4' bottom x 3' deep x 1320' length with a side slope of 2:1 (minimum). Resource concerns: Source Water Depletion - Groundwater depletion. Associated practices: Critical Area Planting (342); Conservation Cover (327); Mulching (484); Structure for Water Control (587).

Before Situation:
The current system lacks an excavated trench (ditch) with a permeable base to collect and store surface water or stormwater runoff to recharge groundwater

After Situation:
An excavated trench (ditch) is constructed to recharge groundwater without negatively impacting groundwater quality, onsite or nearby land uses, and sensitive habitats.

Feature Measure: Volume excavated

Scenario Unit: Cubic Yards

Scenario Typical Size: 1,467.00

Scenario Total Cost: $7,552.60

Scenario Cost/Unit: $5.15

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic Yards	$2.52	1467	$3,696.84
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$100.26	16	$1,604.16
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	18	$722.34
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: 821 - Low Tunnel Systems

Scenario: #43 - Low tunnel < 1000 square feet- Year 1

Scenario Description:
Garden or small farm grows annual crops including vegetables and other truck crops. Rows require a tunnel or floating cover to extend the growing season (early and late) or to protect from other environmental damage. Typical tunnel floats over crop or is supported by hoop or frame above crop. Tunnel cover is less than 48 inches above the soil. Typical row ranges in size from 30 inches by 200 feet up to 400 feet in length. Producer manages seasonal conditions such as soil temperature, exposure to early or late frost, and insects of food crops. Year 1 of implementation only.

Before Situation:
Crop production occurs within the zone growing season. Plant productivity and health is negatively impacted due to weather/environmental conditions delaying planting.

After Situation:
Row covers are applied and managed to improve plant health and productivity by controlling the micro-climate under the tunnel.

Feature Measure: area covered by tunnel

Scenario Unit: Square Feet

Scenario Typical Size: 500.00

Scenario Total Cost: $3,085.87

Scenario Cost/Unit: $6.17

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.39	1	$116.39
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	2	$50.72
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	12	$344.52
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	46	$2,235.60
Materials						
Clear polyethylene plastic, 6.0 mil	2725	6.0 mil, UV-stabilized greenhouse clear plastic with anti-condensation coating.	Square Feet	$0.14	600	$84.00
Netting, Crop Protection, Fine mesh	2761	Synthetic netting fine mesh to exclude small insects. Includes materials and shipping only.	Square Feet	$0.14	600	$84.00
Row Cover Hoops	2810	Galvanized wire hoops to create low tunnels, 9 or 10 gauge wire. Materials and shipping only.	Each	$1.56	44	$68.64
Frost Blanket	2811	Heavy weight blanket, minimum 2 ounces per square yard, for frost protection. Materials and shipping only.	Square Feet	$0.17	600	$102.00

Practice: 821 - Low Tunnel Systems

Scenario: #44 - Low tunnel management- Year 2-3

Scenario Description:
Garden or small farm grows annual crops including vegetables and other truck crops. Rows require a tunnel or floating cover to extend the growing season (early and late) or to protect from other environmental damage. Typical tunnel floats over crop or is supported by hoop or frame above crop. Tunnel cover is less than 48 inches above the soil. Producer manages seasonal conditions such as soil temperature, exposure to early or late frost, and insects of food crops. Year 2-3 of implementation.

Before Situation:
Crop production occurs within the zone growing season. Low tunnel system Year 1 was implemented. Producer is building skill to manage the tunnel coverings as needed during the growing season to improve plant productivity and health.

After Situation:
Row covers are applied and managed to improve plant health and productivity by controlling the micro-climate under the tunnel.

Feature Measure: area of tunnel

Scenario Unit: Square Feet

Scenario Typical Size: 1,000.00

Scenario Total Cost: $559.66

Scenario Cost/Unit: $0.56

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.39	2	$232.78
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	2	$97.20

Practice: 821 - Low Tunnel Systems

Scenario: #45 - Low tunnel 1000-5000 square feet, Year 1

Scenario Description:
Garden or small farm grows annual crops including vegetables and other truck crops. Rows require a tunnel or floating cover to extend the growing season (early and late) or to protect from other environmental damage. Typical tunnel floats over crop or is supported by hoop or frame above crop. Tunnel cover is less than 48 inches above the soil. Typical row ranges in size from 30 inches by 500 feet up to 2000 feet in length. Producer manages seasonal conditions such as soil temperature, exposure to early or late frost, and insects of food crops. Year 1 of implementation only.

Before Situation:
Crop production occurs within the zone growing season. Plant productivity and health is negatively impacted due to weather/environmental conditions delaying planting.

After Situation:
Row covers are applied and managed to improve plant health and productivity by controlling the micro-climate under the tunnel.

Feature Measure: area covered by tunnel

Scenario Unit: Square Feet

Scenario Typical Size: 3,000.00

Scenario Total Cost: $4,930.69

Scenario Cost/Unit: $1.64

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.39	1	$116.39
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	2	$50.72
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	30	$861.30
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	46	$2,235.60
Materials						
Clear polyethylene plastic, 6.0 mil	2725	6.0 mil, UV-stabilized greenhouse clear plastic with anti-condensation coating.	Square Feet	$0.14	3000	$420.00
Netting, Crop Protection, Fine mesh	2761	Synthetic netting fine mesh to exclude small insects. Includes materials and shipping only.	Square Feet	$0.14	3000	$420.00
Row Cover Hoops	2810	Galvanized wire hoops to create low tunnels, 9 or 10 gauge wire. Materials and shipping only.	Each	$1.56	203	$316.68
Frost Blanket	2811	Heavy weight blanket, minimum 2 ounces per square yard, for frost protection. Materials and shipping only.	Square Feet	$0.17	3000	$510.00

Practice: B000BFF1 - Buffer Bundle#1

Scenario: #1 - Buffer Bundle#1

Scenario Description:
Addresses water quality degradation, degraded plant condition, fish/wildlife inadequate habitat, and/or air quality impacts.

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 3.00

Scenario Total Cost: $9,918.11

Scenario Cost/Unit: $3,306.04

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	8	$202.88
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	1	$14.88
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	7	$47.11
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	1	$22.27
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$36.34	6	$218.04
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	10	$181.30
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$10.18	1	$10.18
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$12.51	10	$125.10
Mechanical tree planter	1600	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hours	$5.96	6	$35.76
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$415.54	1.23	$511.11
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$342.50	1.08	$369.90
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acres	$272.50	0.69	$188.03
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	2	$87.74
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	16	$459.36
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	6	$182.16
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	6	$291.60
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	2	$222.90
Materials						

Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$12.66	5	$63.30
Herbicide, Sulfometuron & metsulfuron	344	A residual sulfonylurea herbicide that kills broadleaf weeds and some annual grasses. It is a systemic compound with foliar and soil activity. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$11.34	5	$56.70
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.61	5	$8.05
Shrub, Seedling, Medium	1507	Bare root shrub seedling, 18 to 36 inches tall; includes tropical containerized seedlings 10 to 20 cubic inches. Includes materials and shipping only.	Each	$1.56	341	$531.96
Tree, Hardwood, Seedling, Medium	1510	Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only.	Each	$1.74	2518	$4,381.32
Annual Grasses, Legumes or Forbs	2732	A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$61.36	1	$61.36
Native Perennial Grasses, Legumes and/or Forbs, Medium Density	2754	A mix of native perennial grasses, legumes, and/or forbs, Grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Species typically easy to purchase. Includes material and shipping.	Acres	$272.59	1	$272.59
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	2	$607.88
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: B000CPL10 - YEAR 1 Irrigated Cropland (MRBI/Ogallala)

Scenario: #14 - YEAR 1 Irrigated Cropland (MRBI/Ogallala)

Scenario Description:
Addresses water quality degradation, insufficient water, soil erosion, and inefficient energy.

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied

Feature Measure: acres of cropland where enhancem

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $13,689.51

Scenario Cost/Unit: $136.90

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	30	$760.80
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	19	$833.53
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	16	$777.60
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	41	$4,569.45
Materials						
Nitrogen-Urease inhibitor	260	Nitrogen-Urease inhibitor	Acres	$11.13	100	$1,113.00
Test, Soil Nitrogen Testing	311	Pre-Side Dress/Deep Soil Testing. Includes materials and shipping only.	Each	$12.03	5	$60.15
Switches and Controls, temp sensors	1192	Temperature and soil moisture sensors installed as part of an electronic monitoring (with or without wireless telecommunications) commonly used to control pumps and irrigation systems	Each	$646.73	3	$1,940.19
Data Logger with Telemetry System	1454	Data Logger W/Graphic Output for water management and telemetry - data communication device with power supply in a weather proof enclosure. Equipment only.	Each	$1,663.47	1	$1,663.47
Weather Station, Advanced	2550	Advance Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, temperature, and solar radiation from a solar powered self-standing tripod to an advance weather recording console. Used for both 449 advance irrigation water management and for Activity 202 water quality monitoring .	Each	$973.44	1	$973.44
Annual Grasses	2730	Annual grasses, one or more species, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$40.79	20	$815.80
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08

Practice: B000CPL11 - YEAR 2+ Irrigated Cropland (MRBI/Ogallala)

Scenario: #5 - YEAR 2+ Irrigated Cropland (MRBI/Ogallala)

Scenario Description:
Addresses water quality degradation, insufficient water, and soil erosion.

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied.

Feature Measure: acres of cropland where enhancem

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $5,176.92

Scenario Cost/Unit: $51.77

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	41	$1,798.67
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	24	$1,166.40
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	2	$222.90
Materials						
Nitrogen-Urease inhibitor	260	Nitrogen-Urease inhibitor	Acres	$11.13	100	$1,113.00
Test, Soil Nitrogen Testing	311	Pre-Side Dress/Deep Soil Testing. Includes materials and shipping only.	Each	$12.03	5	$60.15
Annual Grasses	2730	Annual grasses, one or more species, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$40.79	20	$815.80

Practice: B000CPL12 - Non-Irrigated Precision Ag (MRBI)

Scenario: #5 - Non-Irrigated Precision Ag (MRBI)

Scenario Description:
Addresses water quality degradation, soil quality, and soil erosion.

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied

Feature Measure: acres of cropland where enhancem

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $4,149.37

Scenario Cost/Unit: $41.49

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, precision application	949	Chemical application performed by light bar/GPS navigation system. Includes equipment, power unit and labor costs.	Acres	$8.74	100	$874.00
Fertilizer, precision application	952	Fertilizer application performed by light bar/GPS navigation system. Includes equipment, power unit and labor costs.	Acres	$9.16	100	$916.00
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	1	$43.87
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	9	$1,003.05
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$14.19	35	$496.65
Annual Grasses	2730	Annual grasses, one or more species, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$40.79	20	$815.80

Practice: B000CPL13 - Non-Irrigated Cropland (MRBI)

Scenario: #5 - Non-Irrigated Cropland (MRBI)

Scenario Description:
Addresses water quality degradation, soil quality, and soil erosion.

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied.

Feature Measure: acres of cropland where enhancem

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $3,586.02

Scenario Cost/Unit: $35.86

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	11	$482.57
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	10	$1,114.50
Materials						
Nitrogen-Urease inhibitor	260	Nitrogen-Urease inhibitor	Acres	$11.13	100	$1,113.00
Test, Soil Nitrogen Testing	311	Pre-Side Dress/Deep Soil Testing. Includes materials and shipping only.	Each	$12.03	5	$60.15
Annual Grasses	2730	Annual grasses, one or more species, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$40.79	20	$815.80

Practice: B000CPL14 - YEAR 1 Irrigated Precision Ag Cropland (MRBI)

Scenario: #5 - YEAR 1 Irrigated Precision Ag Cropland (MRBI)

Scenario Description:
Addresses water quality degradation, insufficient water, soil erosion, and inefficient energy.

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied

Feature Measure: acres of cropland where enhancem

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $13,929.01

Scenario Cost/Unit: $139.29

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	30	$760.80
Fertilizer, precision application	952	Fertilizer application performed by light bar/GPS navigation system. Includes equipment, power unit and labor costs.	Acres	$9.16	100	$916.00
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	19	$833.53
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	16	$777.60
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	41	$4,569.45
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$14.19	35	$496.65
Switches and Controls, temp sensors	1192	Temperature and soil moisture sensors installed as part of an electronic monitoring (with or without wireless telecommunications) commonly used to control pumps and irrigation systems	Each	$646.73	3	$1,940.19
Data Logger with Telemetry System	1454	Data Logger W/Graphic Output for water management and telemetry - data communication device with power supply in a weather proof enclosure. Equipment only.	Each	$1,663.47	1	$1,663.47
Weather Station, Advanced	2550	Advance Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, temperature, and solar radiation from a solar powered self-standing tripod to an advance weather recording console. Used for both 449 advance irrigation water management and for Activity 202 water quality monitoring .	Each	$973.44	1	$973.44
Annual Grasses	2730	Annual grasses, one or more species, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$40.79	20	$815.80
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08

Practice: B000CPL15 - YEAR 2+ Irrigated Precision Ag Cropland (MRBI)

Scenario: #5 - YEAR 2+ Irrigated Precision Ag Cropland (MRBI)

Scenario Description:
Addresses water quality degradation, insufficient water, and soil erosion.

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied

Feature Measure: acres of cropland where enhancem

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $5,416.42

Scenario Cost/Unit: $54.16

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Fertilizer, precision application	952	Fertilizer application performed by light bar/GPS navigation system. Includes equipment, power unit and labor costs.	Acres	$9.16	100	$916.00
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	41	$1,798.67
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	24	$1,166.40
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	2	$222.90
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$14.19	35	$496.65
Annual Grasses	2730	Annual grasses, one or more species, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$40.79	20	$815.80

Practice: B000CPL16 - Non-Irrigated Cropland with Water Bodies (MRBI)

Scenario: #5 - Non-Irrigated Cropland with Water Bodies (MRBI)

Scenario Description:
Addresses water quality degradation, soil erosion, and soil quality

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied

Feature Measure: acres of cropland where enhancem

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $4,600.98

Scenario Cost/Unit: $46.01

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	2	$13.46
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	2	$44.54
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$415.54	0.82	$340.74
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$342.50	0.72	$246.60
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acres	$272.50	0.46	$125.35
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	11	$482.57
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	9	$1,003.05
Materials						
Nitrogen-Urease inhibitor	260	Nitrogen-Urease inhibitor	Acres	$11.13	100	$1,113.00
Test, Soil Nitrogen Testing	311	Pre-Side Dress/Deep Soil Testing. Includes materials and shipping only.	Each	$12.03	5	$60.15
Herbicide, Imazapyr	336	Pre and post-emergent, non-selective herbicide for control of undesirable vegetation in non-crop areas. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$42.89	2	$85.78
Annual Grasses	2730	Annual grasses, one or more species, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$40.79	20	$815.80
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$134.97	2	$269.94

Practice: B000CPL17 - Non-Irrigated Cropland with Water Bodies Riparian Forest Buffer (MRBI)

Scenario: #5 - Non-Irrigated Cropland with Water Bodies Riparian Forest Buffer (MRBI)

Scenario Description:
Addresses water quality degradation, soil erosion, and soil quality

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied

Feature Measure: acres of cropland where enhancem

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $8,490.37

Scenario Cost/Unit: $84.90

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	18	$456.48
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hours	$31.60	2	$63.20
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	2	$13.46
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$36.34	4	$145.36
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$12.51	16	$200.16
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$415.54	0.82	$340.74
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$342.50	0.72	$246.60
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acres	$272.50	0.46	$125.35
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	11	$482.57
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	18	$516.78
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	4	$121.44
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	4	$194.40
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	9	$1,003.05
Materials						
Nitrogen-Urease inhibitor	260	Nitrogen-Urease inhibitor	Acres	$11.13	100	$1,113.00
Test, Soil Nitrogen Testing	311	Pre-Side Dress/Deep Soil Testing. Includes materials and shipping only.	Each	$12.03	5	$60.15
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$12.66	1	$12.66

Herbicide, Sulfometuron & metsulfuron	344	A residual sulfonylurea herbicide that kills broadleaf weeds and some annual grasses. It is a systemic compound with foliar and soil activity. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$11.34	1	$11.34
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.61	1	$1.61
Tree, Hardwood, Seedling, Medium	1510	Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only.	Each	$1.74	872	$1,517.28
Tree shelter, solid tube type, 4 in. x 48 in.	1566	4 inch x 48 inch tree tube for protection from animal damage. Materials and shipping only.	Each	$5.29	100	$529.00
Stakes, wood, 1 in. x 1 in. x 48 in.	1578	1 in. x 1 in. x 48 in. wood stakes to fasten items in place. Includes materials only.	Each	$2.16	100	$216.00
Annual Grasses	2730	Annual grasses, one or more species, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$40.79	20	$815.80
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: B000CPL18 - Crop Bundle #18 - Precision Ag

Scenario: #5 - Crop Bundle #18 - Precision Ag

Scenario Description:
Addresses water quality degradation, fish and wildlife inadequate habitat, air quality impairment, and either soil erosion or soil quality degradation resource concerns.

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied

Feature Measure: acres of cropland where enhancem

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $4,261.71

Scenario Cost/Unit: $42.62

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, precision application	949	Chemical application performed by light bar/GPS navigation system. Includes equipment, power unit and labor costs.	Acres	$8.74	100	$874.00
Fertilizer, precision application	952	Fertilizer application performed by light bar/GPS navigation system. Includes equipment, power unit and labor costs.	Acres	$9.16	100	$916.00
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$415.54	0.17	$70.64
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$342.50	0.17	$58.23
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acres	$272.50	0.17	$46.33
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	1	$43.87
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	1	$48.60
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	8	$891.60
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$14.19	35	$496.65
Annual Grasses	2730	Annual grasses, one or more species, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$40.79	20	$815.80

Practice: B000CPL19 - Crop Bundle #19 - Soil Health Precision Ag

Scenario: #5 - Crop Bundle #19 - Soil Health Precision Ag

Scenario Description:
Addresses water quality degradation, soil quality degradation, fish and wildlife inadequate habitat, and insufficient water resource concerns.

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied

Feature Measure: acres of cropland where enhancem

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $4,095.83

Scenario Cost/Unit: $40.96

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, precision application	949	Chemical application performed by light bar/GPS navigation system. Includes equipment, power unit and labor costs.	Acres	$8.74	100	$874.00
Fertilizer, precision application	952	Fertilizer application performed by light bar/GPS navigation system. Includes equipment, power unit and labor costs.	Acres	$9.16	100	$916.00
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	2	$87.74
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	13	$1,448.85
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$14.19	35	$496.65
Native Perennial Grasses, Legumes and/or Forbs, Medium Density	2754	A mix of native perennial grasses, legumes, and/or forbs, Grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Species typically easy to purchase. Includes material and shipping.	Acres	$272.59	1	$272.59

Practice: B000CPL20 - Crop Bundle #20 - Soil Health Assessment

Scenario: #5 - Crop Bundle #20 - Soil Health Assessment

Scenario Description:
Addresses water quality degradation, soil quality degradation, fish and wildlife inadequate habitat, and insufficient water resource concerns.

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied.

Feature Measure: acres of cropland where enhancem

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $3,968.23

Scenario Cost/Unit: $39.68

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	12	$526.44
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	16	$1,783.20
Materials						
Nitrogen-Urease inhibitor	260	Nitrogen-Urease inhibitor	Acres	$11.13	100	$1,113.00
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$14.19	15	$212.85
Test, Soil Nitrogen Testing	311	Pre-Side Dress/Deep Soil Testing. Includes materials and shipping only.	Each	$12.03	5	$60.15
Native Perennial Grasses, Legumes and/or Forbs, Medium Density	2754	A mix of native perennial grasses, legumes, and/or forbs, Grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Species typically easy to purchase. Includes material and shipping.	Acres	$272.59	1	$272.59

Practice: B000CPL21 - Crop Bundle #21 - Crop Bundle (Organic)

Scenario: #5 - Crop Bundle #21 - Crop Bundle (Organic)

Scenario Description:
Addresses soil quality degradation, water quality degradation, and degraded plant condition resource concerns.

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied.

Feature Measure: acres of cropland where enhancem

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $6,514.58

Scenario Cost/Unit: $65.15

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	10	$253.60
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	1	$14.88
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	2	$13.46
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	1	$22.27
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	10	$181.30
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$10.18	1	$10.18
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$12.51	10	$125.10
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$415.54	0.82	$340.74
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$342.50	0.72	$246.60
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acres	$272.50	0.46	$125.35
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	10	$438.70
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	10	$287.10
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	9	$1,003.05
Materials						
Nitrogen-Urease inhibitor	260	Nitrogen-Urease inhibitor	Acres	$11.13	100	$1,113.00
Test, Soil Nitrogen Testing	311	Pre-Side Dress/Deep Soil Testing. Includes materials and shipping only.	Each	$12.03	5	$60.15
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$12.66	1	$12.66
Herbicide, Sulfometuron & metsulfuron	344	A residual sulfonylurea herbicide that kills broadleaf weeds and some annual grasses. It is a systemic compound with foliar and soil activity. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$11.34	1	$11.34

Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.61	1	$1.61
Shrub, Seedling, Medium	1507	Bare root shrub seedling, 18 to 36 inches tall; includes tropical containerized seedlings 10 to 20 cubic inches. Includes materials and shipping only.	Each	$1.56	341	$531.96
Tree, Hardwood, Seedling, Medium	1510	Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only.	Each	$1.74	340	$591.60
Annual Grasses, Legumes or Forbs	2732	A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$61.36	1	$61.36
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: B000CPL22 - Crop Bundle #22 - Erosion Bundle (Organic)

Scenario: #5 - Crop Bundle #22 - Erosion Bundle (Organic)

Scenario Description:
Addresses soil quality degradation, water quality degradation, soil erosion, and fish and wildlife inadequate habitat resource concerns.

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied.

Feature Measure: acres of cropland where enhancem

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $4,392.15

Scenario Cost/Unit: $43.92

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	13	$570.31
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	14	$1,560.30
Materials						
Nitrogen-Urease inhibitor	260	Nitrogen-Urease inhibitor	Acres	$11.13	100	$1,113.00
Test, Soil Nitrogen Testing	311	Pre-Side Dress/Deep Soil Testing. Includes materials and shipping only.	Each	$12.03	5	$60.15
Annual Grasses	2730	Annual grasses, one or more species, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$40.79	20	$815.80
Native Perennial Grasses, Legumes and/or Forbs, Medium Density	2754	A mix of native perennial grasses, legumes, and/or forbs, Grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Species typically easy to purchase. Includes material and shipping.	Acres	$272.59	1	$272.59

Practice: B000CPL23 - Crop Bundle #23 - Pheasant and quail habitat

Scenario: #8 - Crop Bundle #23 - Pheasant and quail habitat

Scenario Description:
Addresses wildlife inadequate habitat, water quality degradation and/or air quality impacts, and soil health and/or degraded plant condition.

Before Situation:
Resources are protected at the minimum level of the conservation practice standards applied as part of the bundle.

After Situation:
The adoption of these enhancements will provide resource protection above the minimum level of the conservation practice standard(s) applied

Feature Measure: Acres where the bundle is impleme

Scenario Unit: Acres

Scenario Typical Size: 40.00

Scenario Total Cost: $2,579.68

Scenario Cost/Unit: $64.49

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	1	$14.88
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	1	$6.73
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	1	$22.27
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$415.54	0.41	$170.37
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$342.50	0.36	$123.30
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acres	$272.50	0.23	$62.68
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	2	$87.74
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	2	$57.42
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	4	$445.80
Materials						
Annual Grasses, Legumes or Forbs	2732	A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$61.36	20	$1,227.20
Introduced Perennial Grasses, Legumes and/or Forbs, High Density	2749	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping.	Acres	$88.70	1	$88.70
Native Perennial Grasses, Legumes and/or Forbs, Medium Density	2754	A mix of native perennial grasses, legumes, and/or forbs, Grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Species typically easy to purchase. Includes material and shipping.	Acres	$272.59	1	$272.59

Practice: B000CPL24 - Crop Bundle #24 - Cropland Soil Health Management System

Scenario: #5 - Crop Bundle #24- Cropland Soil Health Management System

Scenario Description:
Addresses soil health, water quality (or water quality and air quality), and either soil erosion, soil compaction, or plant pest pressure.

Before Situation:
Resources are protected at the minimum level of the conservation practice standards applied as part of the bundle.

After Situation:
The adoption of these enhancements will provide resource protection above the minimum level of the conservation practice standard(s) applied.

Feature Measure: acre

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $3,073.49

Scenario Cost/Unit: $30.73

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	2	$87.74
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	14	$1,560.30
Materials						
Nitrogen-Urease inhibitor	260	Nitrogen-Urease inhibitor	Acres	$11.13	100	$1,113.00
Test, Soil Nitrogen Testing	311	Pre-Side Dress/Deep Soil Testing. Includes materials and shipping only.	Each	$12.03	5	$60.15
Test, Soil Health, Basic Package	2734	Basic soil health laboratory assessment for soil organic carbon, aggregation, bioavailable nitrogen, respiration, and active carbon according to technical note 450-03. Includes shipping and handling.	Number	$126.15	2	$252.30

Practice: B000CPL25 - Climate Smart Advanced Soil Health

Scenario: #5 - Crop Land Bundle# 25- Climate Smart Advanced Soil Health

Scenario Description:
Improve crop land soil health by minimizing soil disturbance, PAMS pest management, building soil organic matter, providing habitat and reducing nutrient and pesticide loss to water.

Before Situation:
Resources are protected at the minimum level of the conservation practice standards applied as part of the bundle.

After Situation:
The adoption of these enhancements will provide resource protection above the minimum level of the conservation practice standard(s) applied.

Feature Measure: Acres applied

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $14,905.00

Scenario Cost/Unit: $149.05

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	100	$1,488.00
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	100	$673.00
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	100	$2,227.00
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	11	$482.57
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	17	$1,894.65
Materials						
Nitrogen-Urease inhibitor	260	Nitrogen-Urease inhibitor	Acres	$11.13	100	$1,113.00
Annual Grasses, Legumes or Forbs	2732	A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$61.36	100	$6,136.00
Test, Soil Health, Basic Package	2734	Basic soil health laboratory assessment for soil organic carbon, aggregation, bioavailable nitrogen, respiration, and active carbon according to technical note 450-03. Includes shipping and handling.	Number	$126.15	1	$126.15
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: B000FST1 - Forest Bundle#1

Scenario: #1 - Forest Bundle#1

Scenario Description:
?Addresses forest management on sites that are not adapted to natural fire disturbances. Addresses resouce concerns air quality impacts, degraded plant condition and fish/wildlife inadequate habitat.

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 20.00

Scenario Total Cost: $29,828.32

Scenario Cost/Unit: $1,491.42

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	36	$226.80
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	21	$532.56
Mechanical cutter, chopper	943	Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included.	Hours	$116.89	16	$1,870.24
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$81.82	50	$4,091.00
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	4	$72.52
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$12.51	69	$863.19
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	40	$1,754.80
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	69	$1,980.99
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	16	$485.76
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	14	$680.40
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	37	$4,123.65
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$14.19	10	$141.90
Tree Marking Paint	313	Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only.	Acres	$12.39	15	$185.85
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$12.66	6	$75.96
Herbicide, Imazapyr	336	Pre and post-emergent, non-selective herbicide for control of undesirable vegetation in non-crop areas. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$42.89	20	$857.80
Herbicide, Picloram	337	Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$19.28	11	$212.08

Herbicide, Sulfometuron & metsulfuron	344	A residual sulfonylurea herbicide that kills broadleaf weeds and some annual grasses. It is a systemic compound with foliar and soil activity. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$11.34	6	$68.04
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.61	6	$9.66
Shrub, Seedling, Medium	1507	Bare root shrub seedling, 18 to 36 inches tall; includes tropical containerized seedlings 10 to 20 cubic inches. Includes materials and shipping only.	Each	$1.56	150	$234.00
Tree, Hardwood, Seedling, Small	1509	Bare root hardwood seedlings 6 to 18 inches tall; includes tropical containerized seedlings of 8 cubic inches or smaller. Includes materials and shipping only.	Each	$0.95	1225	$1,163.75
Tree shelter, solid tube type, 4 in. x 60 in.	1567	4 inch x 60 inch tree tube for protection from animal damage. Materials and shipping only.	Each	$6.67	1225	$8,170.75
Cable ties, plastic	1575	Plastic cable ties (typ. 8-12 in.) to assist in securing items. Materials only.	Each	$0.07	3675	$257.25
Stakes, wood, 1 in. x 1 in. x 36 in.	1577	1 in. x 1 in. x 36 in. wood stakes to fasten items in place. Includes materials only.	Each	$1.01	1225	$1,237.25
Certified Organic, Annual Grasses, Legumes and/or Forbs	2343	Annual grasses, mostly introduced but may be native. Used for temporary cover or cover crops. Certified organic. Includes material and shipping only.	Acres	$76.06	3	$228.18
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: B000FST2 - Forest Bundle #2 - Post-fire Management

Scenario: #9 - Forest Bundle #2 - Post-fire Management

Scenario Description:
Forest stand improvement that improves forest health to reduce the risk of wildfire and wildlife habitat. Addresses air quality impacts, degraded plant condition, and fish/wildlife inadequate habitat.

Before Situation:
Resources are protected at the minimum level of conservation practice standard(s) applied as part of the enhancement.

After Situation:
The adoption of these enhancements will provide resource protection above the minimum level of the conservation practice standard(s) applied.

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 10.00

Scenario Total Cost: $10,687.15

Scenario Cost/Unit: $1,068.72

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	8	$50.40
Mechanical cutter, chopper	943	Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included.	Hours	$116.89	28	$3,272.92
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$81.82	30	$2,454.60
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	8	$350.96
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	28	$850.08
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	19	$2,117.55
Materials						
Herbicide, Imazapyr	336	Pre and post-emergent, non-selective herbicide for control of undesirable vegetation in non-crop areas. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$42.89	30	$1,286.70
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: B000FST3 - Forest Bundle #3

Scenario: #5 - B000FST3 - Forest Bundle #3

Scenario Description:
Forest stand improvement that improves forest health due to poor logging practices. Addresses soil organic matter depletion, degraded plant condition, and inadequate fish/wildlife habitat.

Before Situation:
Resources are protected at the minimum level of conservation practice standard(s) applied as part of the enhancement.

After Situation:
The adoption of these enhancements will provide resource protection above the minimum level of the conservation practice standard(s) applied.

Feature Measure: Acres

Scenario Unit: Acres

Scenario Typical Size: 20.00

Scenario Total Cost: $10,994.00

Scenario Cost/Unit: $549.70

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.39	1	$116.39
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	27	$170.10
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	5	$126.80
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$81.82	43	$3,518.26
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	20	$362.60
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	59	$2,588.33
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	4	$114.84
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	1.5	$72.90
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	21	$2,340.45
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$14.19	10	$141.90
Tree Marking Paint	313	Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only.	Acres	$12.39	15	$185.85
Herbicide, Picloram	337	Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$19.28	1	$19.28
Herbicide, Triazine	1321	Broad spectrum herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$66.83	10	$668.30
Certified Organic, Perennial Grasses, Legumes and/or Forbs	2340	Perennial grasses, legumes, and/or forbs, mostly introduced but may be native, may include biennials. Used for permanent plantings such as pastures. Certified organic. Includes material and shipping only.	Acres	$88.02	3	$264.06
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: B000FST4 - Forest Bundle #4

Scenario: #5 - B000FST4 - Forest Bundle #4

Scenario Description:
Forest management to improve sugar maple stands. Addresses soil organic matter depletion, degraded plant condition, and inadequate fish/wildlife habitat.

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied

Feature Measure: Acres

Scenario Unit: Acres

Scenario Typical Size: 20.00

Scenario Total Cost: $25,237.48

Scenario Cost/Unit: $1,261.87

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	33	$207.90
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	10	$253.60
Mechanical cutter, chopper	943	Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included.	Hours	$116.89	16	$1,870.24
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$81.82	50	$4,091.00
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	12	$217.56
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$12.51	36	$450.36
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	33	$1,447.71
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	44	$1,263.24
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	16	$485.76
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	10	$486.00
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	40	$4,458.00
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$14.19	10	$141.90
Tree Marking Paint	313	Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only.	Acres	$12.39	15	$185.85
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$12.66	1.5	$18.99
Herbicide, Imazapyr	336	Pre and post-emergent, non-selective herbicide for control of undesirable vegetation in non-crop areas. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$42.89	20	$857.80
Herbicide, Picloram	337	Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$19.28	10	$192.80

Herbicide, Sulfometuron & metsulfuron	344	A residual sulfonylurea herbicide that kills broadleaf weeds and some annual grasses. It is a systemic compound with foliar and soil activity. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$11.34	1.5	$17.01
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.61	1.5	$2.42
Shrub, Potted, Small	1524	Potted shrub seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$7.79	340	$2,648.60
Tree, Hardwood, Potted, Small	1529	Potted hardwood seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$4.91	360	$1,767.60
Tree shelter, solid tube type, 4 in. x 60 in.	1567	4 inch x 60 inch tree tube for protection from animal damage. Materials and shipping only.	Each	$6.67	360	$2,401.20
Cable ties, plastic	1575	Plastic cable ties (typ. 8-12 in.) to assist in securing items. Materials only.	Each	$0.07	360	$25.20
Stakes, wood, 3/4 in. x 3/4 in. x 60 in.	1583	3/4 in. x 3/4 in. x 60 in. wood stakes to fasten items in place. Includes materials only.	Each	$2.43	360	$874.80
Certified Organic, Perennial Grasses, Legumes and/or Forbs	2340	Perennial grasses, legumes, and/or forbs, mostly introduced but may be native, may include biennials. Used for permanent plantings such as pastures. Certified organic. Includes material and shipping only.	Acres	$88.02	3	$264.06
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	2	$607.88

Practice: B000FST5 - Forest Bundle #5 Climate Smart Increase Carbon Storage

Scenario: #5 - B000FST5 - Forest Bundle # 5: Increase Carbon Sequestration & Storage

Scenario Description:
Improve forest and tree health, enhance wildlife, and reduce soil erosion to support climate change mitigation. Build carbon stocks by increasing sequestration and storage.

Before Situation:
Resources are enhanced above the minimum level of the conservation practice standard(s) applied as part of the bundle.

After Situation:
The adoption of this bundle will provide resource protection above the minimum level of the conservation practice standard(s) applied

Feature Measure: acres

Scenario Unit: Acres

Scenario Typical Size: 10.00

Scenario Total Cost: $25,881.17

Scenario Cost/Unit: $2,588.12

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	44	$277.20
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	23	$583.28
Mechanical cutter, chopper	943	Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included.	Hours	$116.89	8	$935.12
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$81.82	41	$3,354.62
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	16	$290.08
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$12.51	54	$675.54
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	48	$2,105.76
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	54	$1,550.34
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	8	$242.88
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	9	$437.40
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	38	$4,235.10
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$14.19	10	$141.90
Tree Marking Paint	313	Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only.	Acres	$12.39	20	$247.80
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$12.66	5	$63.30
Herbicide, Imazapyr	336	Pre and post-emergent, non-selective herbicide for control of undesirable vegetation in non-crop areas. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$42.89	10	$428.90
Herbicide, Picloram	337	Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$19.28	11	$212.08

Herbicide, Sulfometuron & metsulfuron	344	A residual sulfonylurea herbicide that kills broadleaf weeds and some annual grasses. It is a systemic compound with foliar and soil activity. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$11.34	5	$56.70
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.61	5	$8.05
Tree, Hardwood, Seedling, Small	1509	Bare root hardwood seedlings 6 to 18 inches tall; includes tropical containerized seedlings of 8 cubic inches or smaller. Includes materials and shipping only.	Each	$0.95	1075	$1,021.25
Tree shelter, solid tube type, 4 in. x 60 in.	1567	4 inch x 60 inch tree tube for protection from animal damage. Materials and shipping only.	Each	$6.67	1075	$7,170.25
Cable ties, plastic	1575	Plastic cable ties (typ. 8-12 in.) to assist in securing items. Materials only.	Each	$0.07	3225	$225.75
Stakes, wood, 1 in. x 1 in. x 36 in.	1577	1 in. x 1 in. x 36 in. wood stakes to fasten items in place. Includes materials only.	Each	$1.01	1075	$1,085.75
Certified Organic, Annual Grasses, Legumes and/or Forbs	2343	Annual grasses, mostly introduced but may be native. Used for temporary cover or cover crops. Certified organic. Includes material and shipping only.	Acres	$76.06	3	$228.18
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: B000GRZ1 - Grazing Bundle 1 - Range and Pasture

Scenario: #5 - Grazing Bundle 1 - Range and Pasture

Scenario Description:
This bundle addresses soil erosion, degraded plant condition, and fish and wildlife inadequate habitat resource concerns through adoption of enhancements E528L, E315A, and E645A.

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied.

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 40.00

Scenario Total Cost: $3,915.14

Scenario Cost/Unit: $97.88

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.39	1	$116.39
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	24	$608.64
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$81.82	2	$163.64
Trailer, enclosed, small	1503	Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included.	Hours	$14.56	24	$349.44
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$19.94	10	$199.40
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	58	$1,665.18
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	2	$97.20
Materials						
Wire, Polywire	8	Wire, Polywire for electric fence - 1,300 ft. Includes materials and shipping only.	Each	$47.57	1	$47.57
Electric, Energizer, Solar	27	Electric, Energizer, Solar for electric fence. Includes materials and shipping only.	Each	$363.74	1	$363.74
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: B000GRZ2 - Grazing Bundle 2 - Range and Pasture

Scenario: #5 - Grazing Bundle 2 - Range and Pasture

Scenario Description:
This bundle addresses water quality degradation, fish and wildlife inadequate habitat, and soil erosion resource concerns through adoption of enhancements E472A, E382A, and E580A.

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied.

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 3.50

Scenario Total Cost: $8,840.46

Scenario Cost/Unit: $2,525.85

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hours	$9.89	5	$49.45
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	13	$329.68
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$36.34	5	$181.70
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	9	$163.17
Trailer, enclosed, small	1503	Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included.	Hours	$14.56	8	$116.48
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$12.51	8	$100.08
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	81	$2,325.51
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	5	$151.80
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	8	$388.80
Materials						
Wire, Barbed, Galvanized, 12.5 Gauge, 1,320' roll	1	Galvanized 12.5 gauge, 1,320' roll. Includes materials and shipping only.	Each	$125.50	4	$502.00
Post, Wood, CCA treated, 3-4 in. x 7 ft.	9	Wood Post, Line 3-4 inch dia. X 7 ft., CCA Treated. Includes materials and shipping only.	Each	$11.38	20	$227.60
Post, Wood, CCA treated, 6 in. x 8 ft.	12	Wood Post, End 6 inch dia. X 8 ft., CCA Treated. Includes materials and shipping only.	Each	$25.26	8	$202.08
Post, Steel T, 1.33 lbs, 6 ft.	15	Steel Post, Studded 6 ft. - 1.33 lb. Includes materials and shipping only.	Each	$7.23	90	$650.70
Fence, Wire Assembly, Barbed Wire	30	Brace pins, battens, clips, staples. Includes materials and shipping only.	Feet	$0.20	1320	$264.00
Vinyl Undersill Strips	241	Marking material using the undersill strips of vinyl siding. Priced per foot of fence per each wire. Materials only.	Feet	$0.11	2000	$220.00
Gate, Pipe, 12 ft.	1057	6 rail tube gate, 16 gauge. Includes materials and shipping only.	Each	$239.41	2	$478.82
Shrub, Potted, Small	1524	Potted shrub seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$7.79	65	$506.35
Tree, Hardwood, Potted, Small	1529	Potted hardwood seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$4.91	65	$319.15
Tree, Conifer, Potted, Small	1534	Potted conifer seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$5.08	65	$330.20

Tree shelter, mesh tree tube, 48 in.	1556	48 inch tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only.	Each	$1.54	65	$100.10
Tree shelter, solid tube type, 4 in. x 24 in.	1563	4 inch x 24 inch tree tube for protection from animal damage. Materials and shipping only.	Each	$2.52	65	$163.80
Tree shelter, solid tube type, 4 in. x 48 in.	1566	4 inch x 48 inch tree tube for protection from animal damage. Materials and shipping only.	Each	$5.29	65	$343.85
Stakes, wood, 1 in. x 1 in. x 48 in.	1578	1 in. x 1 in. x 48 in. wood stakes to fasten items in place. Includes materials only.	Each	$2.16	195	$421.20
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: B000GRZ3 - Grazing Bundle 3 - Range and Pasture

Scenario: #5 - Grazing Bundle 3 - Range and Pasture

Scenario Description:
This bundle addresses water quality degradation, fish and wildlife inadequate habitat, and soil erosion resource concerns through adoption of enhancements E472A, E390B, and E580A.

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied.

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 6.00

Scenario Total Cost: $10,103.22

Scenario Cost/Unit: $1,683.87

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hours	$9.89	5	$49.45
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	13	$329.68
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	4	$26.92
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	2	$44.54
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$36.34	5	$181.70
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	8	$145.04
Trailer, enclosed, small	1503	Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included.	Hours	$14.56	8	$116.48
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$12.51	8	$100.08
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$415.54	0.82	$340.74
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$342.50	0.72	$246.60
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acres	$272.50	0.46	$125.35
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	81	$2,325.51
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	5	$151.80
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	8	$388.80
Materials						
Wire, Barbed, Galvanized, 12.5 Gauge, 1,320' roll	1	Galvanized 12.5 gauge, 1,320' roll. Includes materials and shipping only.	Each	$125.50	4	$502.00
Post, Wood, CCA treated, 3-4 in. x 7 ft.	9	Wood Post, Line 3-4 inch dia. X 7 ft., CCA Treated. Includes materials and shipping only.	Each	$11.38	20	$227.60
Post, Wood, CCA treated, 6 in. x 8 ft.	12	Wood Post, End 6 inch dia. X 8 ft., CCA Treated. Includes materials and shipping only.	Each	$25.26	8	$202.08
Post, Steel T, 1.33 lbs, 6 ft.	15	Steel Post, Studded 6 ft. - 1.33 lb. Includes materials and shipping only.	Each	$7.23	90	$650.70
Fence, Wire Assembly, Barbed Wire	30	Brace pins, battens, clips, staples. Includes materials and shipping only.	Feet	$0.20	1320	$264.00

Herbicide, Imazapyr	336	Pre and post-emergent, non-selective herbicide for control of undesirable vegetation in non-crop areas. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$42.89	4	$171.56
Gate, Pipe, 12 ft.	1057	6 rail tube gate, 16 gauge. Includes materials and shipping only.	Each	$239.41	2	$478.82
Shrub, Potted, Small	1524	Potted shrub seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$7.79	65	$506.35
Tree, Hardwood, Potted, Small	1529	Potted hardwood seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$4.91	65	$319.15
Tree, Conifer, Potted, Small	1534	Potted conifer seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$5.08	65	$330.20
Tree shelter, mesh tree tube, 48 in.	1556	48 inch tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only.	Each	$1.54	65	$100.10
Tree shelter, solid tube type, 4 in. x 24 in.	1563	4 inch x 24 inch tree tube for protection from animal damage. Materials and shipping only.	Each	$2.52	65	$163.80
Tree shelter, solid tube type, 4 in. x 48 in.	1566	4 inch x 48 inch tree tube for protection from animal damage. Materials and shipping only.	Each	$5.29	65	$343.85
Stakes, wood, 1 in. x 1 in. x 48 in.	1578	1 in. x 1 in. x 48 in. wood stakes to fasten items in place. Includes materials only.	Each	$2.16	195	$421.20
Native Perennial Grasses, Legumes and/or Forbs, Medium Density	2754	A mix of native perennial grasses, legumes, and/or forbs, Grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Species typically easy to purchase. Includes material and shipping.	Acres	$272.59	2	$545.18
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: B000GRZ4 - Grazing Bundle 4 - Range and Pasture

Scenario: #5 - Grazing Bundle 4 - Range and Pasture

Scenario Description:
This bundle addresses water quality degradation, fish and wildlife inadequate habitat, and soil erosion resource concerns through adoption of enhancements E472A, E391C, and E580A.

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied.

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 4.00

Scenario Total Cost: $13,248.26

Scenario Cost/Unit: $3,312.07

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hours	$9.89	5	$49.45
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	29	$735.44
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hours	$31.60	2	$63.20
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	2	$13.46
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$36.34	9	$327.06
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	8	$145.04
Trailer, enclosed, small	1503	Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included.	Hours	$14.56	8	$116.48
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$12.51	24	$300.24
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$415.54	0.82	$340.74
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$342.50	0.72	$246.60
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acres	$272.50	0.46	$125.35
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	99	$2,842.29
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	9	$273.24
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	12	$583.20
Materials						
Wire, Barbed, Galvanized, 12.5 Gauge, 1,320' roll	1	Galvanized 12.5 gauge, 1,320' roll. Includes materials and shipping only.	Each	$125.50	4	$502.00
Post, Wood, CCA treated, 3-4 in. x 7 ft.	9	Wood Post, Line 3-4 inch dia. X 7 ft., CCA Treated. Includes materials and shipping only.	Each	$11.38	20	$227.60
Post, Wood, CCA treated, 6 in. x 8 ft.	12	Wood Post, End 6 inch dia. X 8 ft., CCA Treated. Includes materials and shipping only.	Each	$25.26	8	$202.08
Post, Steel T, 1.33 lbs, 6 ft.	15	Steel Post, Studded 6 ft. - 1.33 lb. Includes materials and shipping only.	Each	$7.23	90	$650.70
Fence, Wire Assembly, Barbed Wire	30	Brace pins, battens, clips, staples. Includes materials and shipping only.	Feet	$0.20	1320	$264.00

Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$12.66	1	$12.66
Herbicide, Sulfometuron & metsulfuron	344	A residual sulfonylurea herbicide that kills broadleaf weeds and some annual grasses. It is a systemic compound with foliar and soil activity. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$11.34	1	$11.34
Gate, Pipe, 12 ft.	1057	6 rail tube gate, 16 gauge. Includes materials and shipping only.	Each	$239.41	2	$478.82
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.61	1	$1.61
Tree, Hardwood, Seedling, Medium	1510	Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only.	Each	$1.74	872	$1,517.28
Shrub, Potted, Small	1524	Potted shrub seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$7.79	65	$506.35
Tree, Conifer, Potted, Small	1534	Potted conifer seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$5.08	65	$330.20
Tree shelter, mesh tree tube, 48 in.	1556	48 inch tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only.	Each	$1.54	65	$100.10
Tree shelter, solid tube type, 4 in. x 24 in.	1563	4 inch x 24 inch tree tube for protection from animal damage. Materials and shipping only.	Each	$2.52	65	$163.80
Tree shelter, solid tube type, 4 in. x 48 in.	1566	4 inch x 48 inch tree tube for protection from animal damage. Materials and shipping only.	Each	$5.29	165	$872.85
Stakes, wood, 1 in. x 1 in. x 48 in.	1578	1 in. x 1 in. x 48 in. wood stakes to fasten items in place. Includes materials only.	Each	$2.16	295	$637.20
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	2	$607.88

Practice: B000GRZ5 - Grazing Bundle 5 - Range and Pasture

Scenario: #5 - Grazing Bundle 5 - Range and Pasture

Scenario Description:
This bundle addresses livestock production limitation, degraded plant condition, and fish and wildlife inadequate habitat resource concerns through adoption of enhancements E528A, E315A, and E645A.

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied.

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 1,050.00

Scenario Total Cost: $6,631.29

Scenario Cost/Unit: $6.32

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.39	1	$116.39
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	28	$710.08
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$81.82	2	$163.64
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	12	$217.56
Trailer, enclosed, small	1503	Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included.	Hours	$14.56	24	$349.44
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$19.94	36	$717.84
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	65	$1,866.15
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	2	$97.20
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	12	$1,337.40
Materials						
Wire, Polywire	8	Wire, Polywire for electric fence - 1,300 ft. Includes materials and shipping only.	Each	$47.57	1	$47.57
Electric, Energizer, Solar	27	Electric, Energizer, Solar for electric fence. Includes materials and shipping only.	Each	$363.74	1	$363.74
Tank, Polyethylene, 300 gallon	291	Portable heavy duty rubber stock tank.	Each	$340.34	1	$340.34
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: B000LLP1 - Longleaf Pine Bundle#1

Scenario: #1 - Longleaf Pine Bundle#1

Scenario Description:
?Improves conifer forest health through prescribed burning and grazing management. Addresses water quality degredation, degraded plant condition, and fish/wildlife inadequate habitat.

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 110.00

Scenario Total Cost: $13,811.34

Scenario Cost/Unit: $125.56

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hours	$9.89	5	$49.45
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	7	$44.10
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	24	$608.64
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hours	$31.60	2	$63.20
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	2	$13.46
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$36.34	9	$327.06
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$81.82	3	$245.46
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	2	$36.26
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$12.51	16	$200.16
Water tank, portable	1602	Portable water tank transported in a pick up truck. Typically with 200 gallon capacity includes tank with pump, hose and sprayer. Does not include the pickup truck. Equipment only.	Hours	$12.84	2	$25.68
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$415.54	0.82	$340.74
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$342.50	0.72	$246.60
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acres	$272.50	0.46	$125.35
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$19.94	12	$239.28
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	55	$2,412.85
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	53	$1,521.63
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	9	$273.24
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	14	$680.40

Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	3	$334.35
Materials						
Wire, Barbed, Galvanized, 12.5 Gauge, 1,320' roll	1	Galvanized 12.5 gauge, 1,320' roll. Includes materials and shipping only.	Each	$125.50	4	$502.00
Post, Wood, CCA treated, 3-4 in. x 7 ft.	9	Wood Post, Line 3-4 inch dia. X 7 ft., CCA Treated. Includes materials and shipping only.	Each	$11.38	20	$227.60
Post, Wood, CCA treated, 6 in. x 8 ft.	12	Wood Post, End 6 inch dia. X 8 ft., CCA Treated. Includes materials and shipping only.	Each	$25.26	8	$202.08
Post, Steel T, 1.33 lbs, 6 ft.	15	Steel Post, Studded 6 ft. - 1.33 lb. Includes materials and shipping only.	Each	$7.23	90	$650.70
Fence, Wire Assembly, Barbed Wire	30	Brace pins, battens, clips, staples. Includes materials and shipping only.	Feet	$0.20	1320	$264.00
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$12.66	1	$12.66
Herbicide, Picloram	337	Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$19.28	1	$19.28
Herbicide, Sulfometuron & metsulfuron	344	A residual sulfonylurea herbicide that kills broadleaf weeds and some annual grasses. It is a systemic compound with foliar and soil activity. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$11.34	1	$11.34
Gate, Pipe, 12 ft.	1057	6 rail tube gate, 16 gauge. Includes materials and shipping only.	Each	$239.41	2	$478.82
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.61	1	$1.61
Tree, Hardwood, Seedling, Medium	1510	Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only.	Each	$1.74	872	$1,517.28
Tree shelter, solid tube type, 4 in. x 48 in.	1566	4 inch x 48 inch tree tube for protection from animal damage. Materials and shipping only.	Each	$5.29	100	$529.00
Stakes, wood, 1 in. x 1 in. x 48 in.	1578	1 in. x 1 in. x 48 in. wood stakes to fasten items in place. Includes materials only.	Each	$2.16	100	$216.00
Fuel, ignition fuel mixture	1596	Mixture of gasoline and diesel for ignition of prescribed burns. Materials only.	Gallons	$3.71	5	$18.55
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	2	$607.88
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: B000LLP2 - Longleaf Pine Bundle#2

Scenario: #1 - Longleaf Pine Bundle#2

Scenario Description:
Improves conifer forest health through prescribed burning and forest stand management. Addresses air quality impacts, degraded plant condition, and fish/wildlife inadequate habitat.

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standard(s) applied

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 50.00

Scenario Total Cost: $19,147.48

Scenario Cost/Unit: $382.95

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	67	$422.10
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	42	$1,065.12
Mechanical cutter, chopper	943	Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included.	Hours	$116.89	16	$1,870.24
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$81.82	19	$1,554.58
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	2	$36.26
Trailer, enclosed, small	1503	Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included.	Hours	$14.56	24	$349.44
Water tank, portable	1602	Portable water tank transported in a pick up truck. Typically with 200 gallon capacity includes tank with pump, hose and sprayer. Does not include the pickup truck. Equipment only.	Hours	$12.84	2	$25.68
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	83	$3,641.21
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	50	$1,435.50
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	16	$485.76
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	2	$97.20
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	44	$4,903.80
Materials						
Tree Marking Paint	313	Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only.	Acres	$12.39	5	$61.95
Herbicide, Imazapyr	336	Pre and post-emergent, non-selective herbicide for control of undesirable vegetation in non-crop areas. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$42.89	20	$857.80
Herbicide, Picloram	337	Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$19.28	1	$19.28
Fuel, ignition fuel mixture	1596	Mixture of gasoline and diesel for ignition of prescribed burns. Materials only.	Gallons	$3.71	5	$18.55

Native Perennial Grasses, Legumes and/or Forb Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, moderate commercial availability	2619	Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed is moderately easy to purchase commercially. Includes materials and shipping.	Acres	$469.81	1	$469.81
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: B000LLP4 - Longleaf Pine Bundle #4

Scenario: #5 - Longleaf Pine Bundle #4

Scenario Description:
Improves forest health and wildlife habitat through conversion of forest stands that are not predominantly longleaf pine. Addresses degraded plant condition, fish/wildlife inadequate food and habitat, and water quality.

Before Situation:
Resources are protected at the minimum level of the conservation practice standards applied as part of the enhancement.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level of the conservation practice standards applied.

Feature Measure: Acres

Scenario Unit: Acres

Scenario Typical Size: 50.00

Scenario Total Cost: $21,778.44

Scenario Cost/Unit: $435.57

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	157	$989.10
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	18	$456.48
Mechanical cutter, chopper	943	Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included.	Hours	$116.89	20	$2,337.80
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	10	$67.30
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$81.82	23	$1,881.86
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	2	$36.26
Water tank, portable	1602	Portable water tank transported in a pick up truck. Typically with 200 gallon capacity includes tank with pump, hose and sprayer. Does not include the pickup truck. Equipment only.	Hours	$12.84	2	$25.68
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	173	$7,589.51
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	2	$57.42
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	20	$607.20
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	2	$97.20
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	44	$4,903.80
Materials						
Herbicide, Imazapyr	336	Pre and post-emergent, non-selective herbicide for control of undesirable vegetation in non-crop areas. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$42.89	20	$857.80
Herbicide, Picloram	337	Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$19.28	1	$19.28
Fuel, ignition fuel mixture	1596	Mixture of gasoline and diesel for ignition of prescribed burns. Materials only.	Gallons	$3.71	5	$18.55
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: B000PST5 - Pasture Bundle 5

Scenario: #5 - Pasture Bundle #5

Scenario Description:
Implementation of site specific strategies applied to range or pasture land uses through adoption of the following CSP enhancements: E528J, E315A, and E645A.

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
Adoption of these bundled enhancements provides a combined benefit for resource protection that exceeds the minimum level for the associated practice standards in order to address the resource concerns Soil Erosion or Water Quality Degradation, Degraded Plant Condition, and Fish and Wildlife Inadequate Habitat.

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 60.00

Scenario Total Cost: $4,065.85

Scenario Cost/Unit: $67.76

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.39	1	$116.39
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	24	$608.64
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$81.82	2	$163.64
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	6	$108.78
Trailer, enclosed, small	1503	Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included.	Hours	$14.56	24	$349.44
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$19.94	6	$119.64
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	56	$1,607.76
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	2	$97.20
Materials						
Wire, Polywire	8	Wire, Polywire for electric fence - 1,300 ft. Includes materials and shipping only.	Each	$47.57	4	$190.28
Electric, Energizer, Solar	27	Electric, Energizer, Solar for electric fence. Includes materials and shipping only.	Each	$363.74	1	$363.74
Tank, Polyethylene, 300 gallon	291	Portable heavy duty rubber stock tank.	Each	$340.34	1	$340.34

Practice: B000PSTX - Pasture Bundle #6 - Pasture

Scenario: #10 - Pasture Bundle #6

Scenario Description:

Managing the harvest of vegetation with grazing and/or browsing animals for the purposes of maintaining desired pasture composition/plant vigor and improving/maintaining quantity and quality of forage for the animals' health and productivity following the recommendations of a qualifying professional, as detailed in the documentation and implementation requirements. Establishing adapted and/or compatible species, varieties, or cultivars of perennial, herbaceous species that can provide the structure and composition needed to enhance livestock and wildlife habitat, particularly when targeted forage supply and quality, cover, and shelter are not available in other pastures.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing. Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 512 - Pasture and Hay Planting. Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 315-Herbaceous Weed Treatment

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing. The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 512 - Pasture and Hay Planting. The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 315-Herbaceous Weed Treatment.

Feature Measure: Acres

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $9,413.41

Scenario Cost/Unit: $94.13

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	25	$634.00
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$81.82	2	$163.64
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	12	$217.56
Trailer, enclosed, small	1503	Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included.	Hours	$14.56	4	$58.24
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$19.94	36	$717.84
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	5	$143.55
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	4	$194.40
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	12	$1,337.40
Materials						
Wire, Polywire	8	Wire, Polywire for electric fence - 1,300 ft. Includes materials and shipping only.	Each	$47.57	4	$190.28
Electric, Energizer, Solar	27	Electric, Energizer, Solar for electric fence. Includes materials and shipping only.	Each	$363.74	1	$363.74
Tank, Polyethylene, 300 gallon	291	Portable heavy duty rubber stock tank.	Each	$340.34	1	$340.34
Nutritional Balance Analyzer, fecal sample analysis only	1127	NIRS fecal analysis, animal performance report. Includes materials and shipping only.	Each	$46.07	6	$276.42
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$47.76	100	$4,776.00

Practice: B000RNG4 - Range Bundle 4

Scenario: #5 - Range Bundle #4

Scenario Description:
Implementation of site specific strategies applied to range through adoption of the following CSP enhancements: E528N, E315A, and E645A.

Before Situation:
Resources are protected at the minimum level of the conservation practice standard(s) applied as part of the enhancement.

After Situation:
Adoption of these bundled enhancements provides a combined benefit for resource protection that exceeds the minimum level for the associated practice standards in order to address the resource concerns Soil Erosion, Degraded Plant Condition, and Fish and Wildlife Inadequate Habitat.

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 50.00

Scenario Total Cost: $4,580.13

Scenario Cost/Unit: $91.60

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.39	1	$116.39
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	24	$608.64
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$81.82	2	$163.64
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	8	$145.04
Trailer, enclosed, small	1503	Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included.	Hours	$14.56	24	$349.44
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	58	$1,665.18
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	4	$194.40
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	12	$1,337.40

Practice: E199A - Comprehensive Conservation Plan

Scenario: #5 - Single Enterprise-Low

Scenario Description:

Conservation plan developed by a Technical Service Provider (TSP) for a participant enrolled in a contract through the Conservation Stewardship Program (CSP). NRCS will use the Conservation Assessment and Ranking Tool (CART) to identify all State priority resource concern categories (PRCCs) that the TSP must include in the CSP CCP. TSP develops a minimum of one conservation system alternative for one land use by each land management system included in the producer???s operation. This typical scenario involves one agricultural enterprise and a.) 1 Land use with less than or equal to 4 priority resource concerns, OR b.) 2-3 Land Uses with less than or equal to two priority resource concern categories per land use.

Before Situation:

NRCS has identified priority resource concern categories that have not met stewardship thresholds. State priority resource concern categories need to be evaluated for one land use and each land management system.

After Situation:

TSP conducts an on-site inventory of all land uses and land management systems in the producer???s operation. Assessment for each priority resource concern is completed by land use. Conservation practices, enhancements or bundles are identified. Develops a minimum of one conservation system alternative for each land use that meet the producer's objectives. Plan document follows the requirements ofE199A Guide sheet and meets Conservation Plan CPA 199 or applicable conservation activities CPA 102 CNMP or CPA 106 Forestry Plan.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $7,088.06

Scenario Cost/Unit: $7,088.06

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$108.51	10	$1,085.10
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	8	$853.76
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$85.82	60	$5,149.20

Practice: E199A - Comprehensive Conservation Plan

Scenario: #21 - Single Enterprise-Medium

Scenario Description:

Conservation plan developed by a Technical Service Provider (TSP) for a participant enrolled in a contract through the Conservation Stewardship Program (CSP). NRCS will use the Conservation Assessment and Ranking Tool (CART) to identify all State priority resource concern categories (PRCCs) that the TSP must include in the CSP CCP. TSP develops a minimum of one conservation system alternative for one land use by each land management system included in the producer???s operation. This typical scenario involves one agricultural enterprise and a.) 1 Land Use with greater than 4 priority resource concerns, OR b.) 2-3 Land Use with 3 to 4 priority resource concern categories per land use, OR c.) 4 or more Land Use with less than or equal to 2 priority resource concerns.

Before Situation:

NRCS has identified priority resource concern categories that have not met stewardship thresholds. State priority resource concern categories need to be evaluated for one land use and each land management system.

After Situation:

TSP conducts an on-site inventory of all land uses and land management systems in the producer???s operation. Assessment for each priority resource concern is completed by land use. Conservation practices, enhancements or bundles are identified. Develops a minimum of one conservation system alternative for each land use that meet the producer's objectives. Plan document follows the requirements ofE199A Guide sheet and meets Conservation Plan CPA 199 or applicable conservation activities CPA 102 CNMP or CPA 106 Forestry Plan.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $9,231.34

Scenario Cost/Unit: $9,231.34

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$108.51	10	$1,085.10
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	12	$1,280.64
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$85.82	80	$6,865.60

Practice: E199A - Comprehensive Conservation Plan

Scenario: #37 - Single Enterprise-High

Scenario Description:

Conservation plan developed by a Technical Service Provider (TSP) for a participant enrolled in a contract through the Conservation Stewardship Program (CSP). NRCS will use the Conservation Assessment and Ranking Tool (CART) to identify all State priority resource concern categories (PRCCs) that the TSP must include in the CSP CCP. TSP develops a minimum of one conservation system alternative for one land use by each land management system included in the producer???s operation. This typical scenario involves one agricultural enterprise and a.) 2-3 Land Use with 4 or more priority resource concern categories per land use, OR b.) 4 or more Land Use with 3 to 4 priority resource concerns.

Before Situation:

NRCS has identified priority resource concern categories that have not met stewardship thresholds. State priority resource concern categories need to be evaluated for one land use and each land management system.

After Situation:

TSP conducts an on-site inventory of all land uses and land management systems in the producer???s operation. Assessment for each priority resource concern is completed by land use. Conservation practices, enhancements or bundles are identified. Develops a minimum of one conservation system alternative for each land use that meet the producer's objectives. Plan document follows the requirements ofE199A Guidesheet and meets Conservation Plan CPA 199 or applicable conservation activities CPA 102 CNMP or CPA 106 Forestry Plan.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $11,401.54

Scenario Cost/Unit: $11,401.54

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$108.51	30	$3,255.30
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	12	$1,280.64
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$85.82	80	$6,865.60

Practice: E199A - Comprehensive Conservation Plan

Scenario: #53 - Multiple Enterprise-Medium

Scenario Description:

Conservation plan developed by a Technical Service Provider (TSP) for a participant enrolled in a contract through the Conservation Stewardship Program (CSP). NRCS will use the Conservation Assessment and Ranking Tool (CART) to identify all State priority resource concern categories (PRCCs) that the TSP must include in the CSP CCP. TSP develops a minimum of one conservation system alternative for one land use by each land management system included in the producer???s operation. This typical scenario involves two or more agricultural enterprises and a.) 1 Land Use with up to 4 priority resource concerns, OR b.) 2-3 Land Use with 1 to 2 priority resource concern categories per land use.

Before Situation:

NRCS has identified priority resource concern categories that have not met stewardship thresholds. State priority resource concern categories need to be evaluated for one land use and each land management system.

After Situation:

TSP conducts an on-site inventory of all land uses and land management systems in the producer???s operation. Assessment for each priority resource concern is completed by land use. Conservation practices, enhancements or bundles are identified. Develops a minimum of one conservation system alternative for each land use that meet the producer's objectives. Plan document follows the requirements ofE199A Guide sheet and meets Conservation Plan CPA 199 or applicable conservation activities CPA 102 CNMP or CPA 106 Forestry Plan.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $12,686.62

Scenario Cost/Unit: $12,686.62

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$108.51	30	$3,255.30
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	16	$1,707.52
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$85.82	90	$7,723.80

Practice: E199A - Comprehensive Conservation Plan

Scenario: #69 - Multiple Enterprise-High

Scenario Description:

Conservation plan developed by a Technical Service Provider (TSP) for a participant enrolled in a contract through the Conservation Stewardship Program (CSP). NRCS will use the Conservation Assessment and Ranking Tool (CART) to identify all State priority resource concern categories (PRCCs) that the TSP must include in the CSP CCP. TSP develops a minimum of one conservation system alternative for one land use by each land management system included in the producer???s operation. This typical scenario involves two or more agricultural enterprises and a.) 2-3 Land Use with 3 to 4 priority resource concern categories per land use, OR b.) 2-3 Land Use with 4 or more priority resource concerns, OR c.) 4 or more Land Use with any amount of priority resource concerns

Before Situation:

NRCS has identified priority resource concern categories that have not met stewardship thresholds. State priority resource concern categories need to be evaluated for one land use and each land management system.

After Situation:

TSP conducts an on-site inventory of all land uses and land management systems in the producer???s operation. Assessment for each priority resource concern is completed by land use. Conservation practices, enhancements or bundles are identified. Develops a minimum of one conservation system alternative for each land use that meet the producer's objectives. Plan document follows the requirements ofE199A Guide sheet and meets Conservation Plan CPA 199 or applicable conservation activities CPA 102 CNMP or CPA 106 Forestry Plan.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $14,629.92

Scenario Cost/Unit: $14,629.92

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hours	$108.51	40	$4,340.40
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	16	$1,707.52
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$85.82	100	$8,582.00

Practice: E199A - Comprehensive Conservation Plan

Scenario: #85 - Comprehensive Conservation Plan for Operation with > 2 land uses and 2 or more resource concerns

Scenario Description:

Conservation plan developed by a Technical Service Provider (TSP) for a participant enrolled in a contract through the Conservation Stewardship Program (CSP). NRCS will use the Conservation Assessment and Ranking Tool (CART) to identify all State priority resource concern categories (PRCCs) that the TSP must include in the CSP CCP. TSP develops a minimum of one conservation system alternative for the identified land uses by each land management system included in each of the producer???s operations. Does not include livestock waste storage planning or evaluation of existing components.

Before Situation:

NRCS has identified priority resource concern categories that have not met stewardship thresholds. State priority resource concern categories need to be evaluated for all land uses and each land management system for each enterprise or farm operation.

After Situation:

Planner conducts an on-site inventory of all land uses and land management systems in the producer???s operation. Assessment for each priority resource concern is completed by land use. Conservation practices, enhancements or bundles are identified. Develops a minimum of one conservation system alternative for each land use that meet the producer's objectives. Plan document follows the requirements of E199A Guidesheet.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $3,857.46

Scenario Cost/Unit: $3,857.46

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	8	$853.76
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$85.82	35	$3,003.70

Practice: E199A - Comprehensive Conservation Plan

Scenario: #101 - Comprehensive Conservation Plan on 2 or more Land Use

Scenario Description:

Conservation plan developed by a Technical Service Provider (TSP) for a participant enrolled in a contract through the Conservation Stewardship Program (CSP). NRCS will use the Conservation Assessment and Ranking Tool (CART) to identify all State priority resource concern categories (PRCCs) that the TSP must include in the CSP CCP. TSP develops a minimum of one conservation system alternative for the identified land uses by each land management system included in the producer???s operation. Does not include livestock waste storage planning or evaluation of existing components.

Before Situation:

NRCS has identified priority resource concern categories that have not met stewardship thresholds. State priority resource concern categories need to be evaluated for 2 land uses and each land management system for each enterprise or farm operation.

After Situation:

Planner conducts an on-site inventory of all land uses and land management systems in the producer???s operation. Assessment for each priority resource concern is completed by land use. Conservation practices, enhancements or bundles are identified. Develops a minimum of one conservation system alternative for each land use that meet the producer's objectives. Plan document follows the requirements of E199A Guidesheet.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $3,428.36

Scenario Cost/Unit: $3,428.36

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	8	$853.76
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$85.82	30	$2,574.60

Practice: E199A - Comprehensive Conservation Plan

Scenario: #117 - Basic Comprehensive Conservation Plan-One Land Use

Scenario Description:

Conservation plan developed by a Technical Service Provider (TSP) for a participant enrolled in a contract through the Conservation Stewardship Program (CSP). NRCS will use the Conservation Assessment and Ranking Tool (CART) to identify all State priority resource concern categories (PRCCs) that the TSP must include in the CSP CCP. TSP develops a minimum of one conservation system alternative for one land use by each land management system included in the producer???s operation. Does not include livestock waste storage planning or evaluation of existing components.

Before Situation:

NRCS has identified priority resource concern categories that have not met stewardship thresholds. State priority resource concern categories need to be evaluated for one land use and each land management system.

After Situation:

Planner conducts an on-site inventory of all land uses and land management systems in the producer???s operation. Assessment for each priority resource concern is completed by land use. Conservation practices, enhancements or bundles are identified. Develops a minimum of one conservation system alternative for each land use that meet the producer's objectives. Plan document follows the requirements ofE199A Guidesheet.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $2,570.16

Scenario Cost/Unit: $2,570.16

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hours	$106.72	8	$853.76
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hours	$85.82	20	$1,716.40

Practice: E314A - Brush management to improve wildlife habitat

Scenario: #1 - Brush management to improve wildlife habitat

Scenario Description:
Brush management is employed to create a desired plant community, consistent with the related ecological site steady state, which will maintain or enhance the wildlife habitat desired for the identified wildlife species. It will be designed to provide plant structure, density and diversity needed to meet those habitat objectives. This enhancement does not apply to removal of woody vegetation by prescribed fire or removal of woody vegetation to facilitate a land use change.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 314 - Brush Management

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 314 - Brush Management

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $2,148.31

Scenario Cost/Unit: $21.48

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.39	1	$116.39
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$19.94	12	$239.28
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	32	$1,403.84
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	8	$388.80

Practice: E315A - Herbaceous weed treatment to create plant communities consistent with the ecological site

Scenario: #1 - Herbaceous weed treatment to create plant communities consistent with the ecological site

Scenario Description:
Mechanical, chemical, or biological, herbaceous weed treatment will be employed to control targeted, herbaceous weeds so as to create, release, or restore desired plant communities that are consistent with achievable, ecological site, steady state descriptions.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 315 - Herbaceous Weed Control

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 315 - Herbaceous Weed Control

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 10.00

Scenario Total Cost: $163.64

Scenario Cost/Unit: $16.36

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$81.82	2	$163.64

Practice: E327A - Conservation cover for pollinators and beneficial insects

Scenario: #6 - Conservation cover for pollinators and beneficial insects

Scenario Description:
Seed or plug nectar and pollen producing plants in non-cropped areas such as field borders, vegetative barriers, contour buffer strips, grassed waterways, shelterbelts, hedgerows, windbreaks, conservation cover, and riparian forest and herbaceous buffers.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 327 Conservation Cover.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 327 Conservation Cover.

Feature Measure: acre planted

Scenario Unit: Acres

Scenario Typical Size: 50.00

Scenario Total Cost: $27,175.80

Scenario Cost/Unit: $543.52

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	11	$278.96
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hours	$31.60	8	$252.80
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acres	$22.61	50	$1,130.50
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	26	$746.46
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	6	$668.70
Materials						
Native Perennial Grasses, Legumes and/or Forb Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, moderate commercial availability	2619	Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed is moderately easy to purchase commercially. Includes materials and shipping.	Acres	$469.81	50	$23,490.50
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	2	$607.88

Practice: E327B - Establish Monarch butterfly habitat

Scenario: #1 - Establish Monarch butterfly habitat

Scenario Description:
Seed or plug milkweed (Asclepias spp.), and high-value monarch butterfly nectar plants on marginal cropland, field borders, contour buffer strips, and similar areas.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 327 - Conservation Cover

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 327 - Conservation Cover

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $883.88

Scenario Cost/Unit: $883.88

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hours	$31.60	1	$31.60
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$81.82	2	$163.64
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$10.18	1	$10.18
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	2	$97.20
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	1	$111.45
Materials						
Native Perennial Grasses, Legumes and/or Forb Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, moderate commercial availability	2619	Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed is moderately easy to purchase commercially. Includes materials and shipping.	Acres	$469.81	1	$469.81

Practice: E328A - Resource conserving crop rotation

Scenario: #1 - Resource conserving crop rotation

Scenario Description:
Establish a Resource Conserving Crop Rotation. Rotation must include AT LEAST one resource conserving crop as determined by the State Conservationist in a minimum three year crop rotation. The crop rotation will reduce soil erosion (water and wind), improve soil health, improve soil moisture efficiency, and reduce plant pest pressures.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $1,560.30

Scenario Cost/Unit: $15.60

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	14	$1,560.30

Practice: E328B - Improved resource conserving crop rotation

Scenario: #1 - Improved resource conserving crop rotation

Scenario Description:

Improve an existing Resource Conserving Crop Rotation. Must enrich an existing rotation which already includes AT LEAST one resource conserving crop as determined by the State Conservationist in a minimum three year crop rotation. The crop rotation will reduce soil erosion (water and wind), improve soil health, improve soil moisture efficiency, and reduce plant pest pressures.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $557.25

Scenario Cost/Unit: $5.57

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	5	$557.25

Practice: E328C - Conservation crop rotation on recently converted CRP grass/legume cover

Scenario: #1 - Conservation crop rotation on recently converted CRP grass/legume cover for water erosion

Scenario Description:

Implement a crop rotation management system on crop land acres that have recently converted from CRP grass/legume conservation cover to annual planted crops. Crop rotation minimizes disturbance resulting in a Soil Tillage Intensity Rating (STIR) less than 10 and reduces soil erosion from water or wind to below soil tolerance (T) level. The current NRCS wind and water erosion prediction technologies must be used to document the rotation, soil erosion estimate, and STIR calculations. *This enhancement is limited to acres where the conversion event took place not more than 2 years prior. Enhancement not applicable on hayland.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $334.35

Scenario Cost/Unit: $3.34

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	3	$334.35

Practice: E328D - Leave standing grain crops unharvested to benefit wildlife

Scenario: #1 - Leave standing grain crops unharvested to benefit wildlife

Scenario Description:
Implement a crop rotation which allows a portion of grain crops to be left in fields un-harvested to provide food and cover for wildlife during winter months.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 40.00

Scenario Total Cost: $223.79

Scenario Cost/Unit: $5.59

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$415.54	0.17	$70.64
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$342.50	0.17	$58.23
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acres	$272.50	0.17	$46.33
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	1	$48.60

Practice: E328E - Soil health crop rotation

Scenario: #1 - Soil health crop rotation

Scenario Description:

Implement a crop rotation which addresses all four principle components of soil health: increases diversity of the cropping system; maintains residue throughout the year; keeps a living root; and minimizes soil chemical, physical and biological disturbance. The rotation will include at least 4 different crop and/or cover crop types (crop types include cool season grass, warm season grass, cool season broadleaf, warm season broadleaf) grown in a sequence that will produce a positive trend in the Organic Matter (OM) sub factor value over the life of the rotation, as determined by the Soil Conditioning Index (SCI). The current NRCS wind and water erosion prediction technologies must be used to document the rotation and SCI calculations.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $557.25

Scenario Cost/Unit: $5.57

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	5	$557.25

Practice: E328F - Modifications to improve soil health and increase soil organic matter

Scenario: #1 - Modifications to improve soil health and increase soil organic matter

Scenario Description:
Use of soil health assessment to evaluate impact of current conservation crop rotation in addressing soil organic matter depletion (primary assessment made in Year 1). Modifications to the crop rotation and/or crop management will be made as a result of the assessment results (adding a new crop and/or cover crop to the rotation; making changes to planting and/or tillage system, harvest timing of crops, or termination timing of cover crops). During Year 3 a follow up assessment will be completed to allow time for the modifications to show increased soil organic matter. Modified system must produce a positive trend in the Organic Matter (OM) sub factor value over the life of the rotation, as determined by the Soil Conditioning Index (SCI). The current NRCS wind and water erosion prediction technologies must be used to document the rotation and SCI calculations.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $237.60

Scenario Cost/Unit: $2.38

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	1	$111.45
Materials						
Test, Soil Health, Basic Package	2734	Basic soil health laboratory assessment for soil organic carbon, aggregation, bioavailable nitrogen, respiration, and active carbon according to technical note 450-03. Includes shipping and handling.	Number	$126.15	1	$126.15

Practice: E328G - Crop rotation on recently converted CRP grass/legume cover for soil organic matter improvement

Scenario: #1 - Crop rotation on recently converted CRP grass/legume cover for soil organic matter improvement

Scenario Description:
Crop rotation on acres converted, no more than 2 years prior, from CRP grass/legume cover to annual crops. Diverse rotation with living roots and residue cover throughout year and minimal disturbance. Enhancement not applicable on hayland.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $557.25

Scenario Cost/Unit: $5.57

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	5	$557.25

Practice: E328H - Conservation crop rotation to reduce the concentration of salts

Scenario: #1 - Conservation crop rotation to reduce the concentration of salts

Scenario Description:

Implement a crop rotation to reduce the concentration of salts and other chemicals from saline seeps. The rotation should include at least 3 crops and/or cover crops grown in a sequence in the recharge areas of saline seeps that have rooting depths and water requirements adequate to fully utilize all available soil water. Do not use summer fallow. Use an approved water balance procedure to determine crop selection and sequence. Select crops with a tolerance to salinity levels that match the salinity of the discharge area. (See state lists)

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $445.80

Scenario Cost/Unit: $4.46

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	4	$445.80

Practice: E328I - Forage harvest to reduce water quality impacts by utilization of excess soil nutrients

Scenario: #1 - Forage harvest to reduce water quality impacts by utilization of excess soil nutrients

Scenario Description:
Establish a forage crop (single species or mix) following a primary annual crop to take up excess soil nutrients. Select forage known to effectively utilize and scavenge nutrients. Forage shall be harvested for forage, but not be grazed or burned.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

Feature Measure: Acres of Cropland with New Crop R

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $516.75

Scenario Cost/Unit: $5.17

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	4	$445.80
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$14.19	5	$70.95

Practice: E328J - Improved crop rotation to provide benefits to pollinators

Scenario: #1 - Improved crop rotation to provide benefits to pollinators

Scenario Description:

Improve the existing crop rotation by adding pollinator friendly crops into the rotation. The crop rotation shall include a minimum of three different crops in a minimum five year crop rotation. Each year, the pollinator friendly crop will be planted on a minimum of 5% of cropland acres contained within the agricultural operation. Use of insecticides is limited for the pollinator friendly crop.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation

Feature Measure: Acres planted to pollinator rotation

Scenario Unit: Acres

Scenario Typical Size: 5.00

Scenario Total Cost: $445.80

Scenario Cost/Unit: $89.16

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	4	$445.80

Practice: E328K - Multiple crop types to benefit wildlife

Scenario: #5 - Multiple crop types to benefit wildlife

Scenario Description:
Alternating crops in a systematic arrangement of strips across a field to provide diverse rotations of crops that provide wildlife food. At least two crops will be planted in adjacent strips a minimum of 0.5 acres in size.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard 328 - Conservation Crop Rotation.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard 328 - Conservation Crop Rotation.

Feature Measure: Acres

Scenario Unit: Acres

Scenario Typical Size: 20.00

Scenario Total Cost: $111.45

Scenario Cost/Unit: $5.57

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	1	$111.45

Practice: E328L - Leaving tall crop residue for wildlife

Scenario: #5 - Leaving tall crop residue for wildlife

Scenario Description:
Fields may be harvested but must leave crop residue standing a minimum of 14 inches. Residue will be left through winter and into spring, providing valuable winter cover and forage for wildlife spanning late summer and through the following winter.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation.

Feature Measure: acres with small grain stubble/resid

Scenario Unit: Acres

Scenario Typical Size: 40.00

Scenario Total Cost: $445.80

Scenario Cost/Unit: $11.15

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	4	$445.80

Practice: E328M - Diversify crop rotation with canola or sunflower to provide benefits to pollinators

Scenario: #21 - Diversify crop rotation with canola or sunflower to provide benefits to pollinators

Scenario Description:
Diversify the existing crop rotation by adding canola or sunflower into the rotation. Canola or sunflower must be planted on a minimum of 5% of cropland acres. Pesticide use is limited to pre-bloom or bloom and in accordance with IPM and industry best management practices.

Before Situation:
Resources are protected at the minimum level for the Conservation Practice Standard (CPS) 328- Conservation Crop Rotation.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 328-Conservation Crop Rotation

Feature Measure: Acres planned

Scenario Unit: Acres

Scenario Typical Size: 40.00

Scenario Total Cost: $445.80

Scenario Cost/Unit: $11.15

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	4	$445.80

Practice: E328O - Perennial Grain Conservation Crop Rotation

Scenario: #5 - Perennial Grain Rotation

Scenario Description:

This practice payment is provided to the producer for the time needed to plan and implement the logistics of changing the rotation to effectively implement a conservation crop rotation on a cropland farm by adding a perennial grain as the third crop to their cropping system. The crop is intended to be a harvested and must be grown for at least 2 years after planting. No foregone income. Cost represents typical situations for conventional and organic producers. In this region this practice may be part of a conservation management system on both organic and non-organic operations that: (1) Reduces erosion; (2) Improves soil fertility and tilth; (3) Interrupts pest cycles; and (4) Builds soil organic matter. In applicable areas, reduces depletion of soil moisture or otherwise reduces the need for irrigation.

Before Situation:

Resources are protected at the minimum level for the Conservation Practice Standard (CPS) 328- Conservation Crop Rotation.

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 328-Conservation Crop Rotation.

Feature Measure: Area Planted

Scenario Unit: Acres

Scenario Typical Size: 40.00

Scenario Total Cost: $6,561.37

Scenario Cost/Unit: $164.03

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.39	3	$349.17
Equipment Installation						
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	40	$890.80
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	40	$1,148.40
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	40	$1,944.00
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	20	$2,229.00

Practice: E328P - Low Nitrogen Requirement Annual Crop Rotation

Scenario: #5 - Low Nitrogen Requirement Annual Crop Rotation

Scenario Description:
Design an annual crop rotation which less than the average annual nitrogen fertilizer requirement compared to the current (benchmark) crop rotation.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 328 - Conservation Crop Rotation.

Feature Measure: Acres

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $2,875.49

Scenario Cost/Unit: $28.75

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.39	1	$116.39
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	10	$287.10
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	5	$243.00
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	20	$2,229.00

Practice: E329A - No till to reduce soil erosion

Scenario: #1 - No till to reduce soil erosion

Scenario Description:
Establish no till system to reduce sheet and rill erosion soil loss. Field(s) must have a soil loss at or below the soil tolerance (T) level for water and wind erosion for the crop rotation and a Soil Tillage Intensity Rating (STIR) of no greater than 10 for each crop in the planned rotation. The current NRCS wind and water erosion prediction technologies must be used to calculate soil loss and STIR.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 329 - Residue and Tillage Management - No-Till/ Strip Till/ Direct Seed

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 329 - Residue and Tillage Management - No-Till/ Strip Till/ Direct Seed

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $334.35

Scenario Cost/Unit: $3.34

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	3	$334.35

Practice: E329B - No till to reduce tillage induced particulate matter

Scenario: #1 - No till to reduce tillage induced particulate matter

Scenario Description:

Establish no till system to reduce tillage induced particulate matter. Field(s) must have a soil loss at or below the soil tolerance (T) level for the crop rotation and a Soil Tillage Intensity Rating (STIR) of no greater than 10 for each crop in the planned rotation. The current NRCS wind and water erosion prediction technologies must be used to document soil loss and STIR calculations.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 329 - Residue and Tillage Management - No-Till/ Strip Till/ Direct Seed

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 329 - Residue and Tillage Management - No-Till/ Strip Till/ Direct Seed

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $334.35

Scenario Cost/Unit: $3.34

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	3	$334.35

Practice: E329C - No till to increase plant-available moisture

Scenario: #1 - No till to increase plant-available moisture

Scenario Description:

Establish a no till system to increase plant-available moisture. Each crop in the crop rotation shall have a Soil Tillage Intensity Rating (STIR) of no greater than 20. The current NRCS wind and water erosion prediction technologies must be used to document STIR calculations. Maintain a minimum 60 percent surface residue cover throughout the year to reduce evaporation from the soil surface.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 329 - Residue and Tillage Management - No-Till/ Strip Till/ Direct Seed

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 329 - Residue and Tillage Management - No-Till/ Strip Till/ Direct Seed

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $334.35

Scenario Cost/Unit: $3.34

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	3	$334.35

Practice: E329D - No till system to increase soil health and soil organic matter content

Scenario: #1 - No till system to increase soil health and soil organic matter content

Scenario Description:

Establish a no till system to increase soil health and soil organic matter content. Each crop in the crop rotation shall have a Soil Tillage Intensity Rating (STIR) of no greater than 20. The crop rotation must achieve a soil conditioning index (SCI) of zero or higher. The current NRCS wind and water erosion prediction technologies must be used to document STIR and SCI calculations. Residue shall not be burned, grazed, or harvested.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 329 - Residue and Tillage Management - No-Till/ Strip Till/ Direct Seed

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 329 - Residue and Tillage Management - No-Till/ Strip Till/ Direct Seed

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $445.80

Scenario Cost/Unit: $4.46

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	4	$445.80

Practice: E329E - No till to reduce energy

Scenario: #1 - No till to reduce energy

Scenario Description:

Establish a no till system which reduces total energy consumption associated with field operations by at least 25% compared to current tillage system (benchmark). Each crop in the crop rotation shall have a Soil Tillage Intensity Rating (STIR) of no greater than 20. The current NRCS wind and water erosion prediction technologies must be used to document STIR calculations and energy consumption.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 329 - Residue and Tillage Management - No-Till/ Strip Till/ Direct Seed

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 329 - Residue and Tillage Management - No-Till/ Strip Till/ Direct Seed

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $445.80

Scenario Cost/Unit: $4.46

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	4	$445.80

Practice: E329F - No-till into green cover crop to improve soil organic matter quantity and quality

Scenario: #5 - Residue and Tillage Management, No-Till - Planting Green

Scenario Description:

This scenario applies to cropland where residue and tillage management prepares the field for ???planting green??? techniques where cash crops are planted into living cover crop residues. This practice is based on economic and social data obtained from the North Jersey RC&D On-Farm Trials Soil Health Demo CIG Project results. This scenario involves the site preparation and management of live cover crop residues during no-till planting events. The practice will be used to drastically reduce soil erosion, reduce CO2 losses from the field, maximize the four principles of soil health and related resource concerns, mitigate pesticide usage and amplify the benefits of supporting practices. The typical scenario size is 100 acres.

Before Situation:

Row crops or small grains are grown and harvested. Cover crop and/or crop residues that are present are too fragile or not in a quantity to adequately address soil, water, and air resource concerns. Residues are dead at the time of planting, leaving soils with lowered microbial activity. If cover crops are planted in the fall, they are terminated through tillage or chemical means early in the spring, providing little environmental benefit and the ground is left tilled or fallow between cover crop termination and cash crop planting, allowing for soil erosion, the release of greenhouse gases, and nutrient losses to groundwater and surface waters. The soils are not functioning properly and are heavily supplemented with chemical inputs. Current tillage operations are not able to address resource concerns. No-till if utilized is limited due to residue quantity or quality.

After Situation:

Live residues are maintained for extended periods of time in the spring, providing soil coverage that is adequate to control erosion and runoff and sedimentation. Soils are no-tilled and cover crop residues accumulate carbon providing carbon sequestration benefits as well as increasing soil microbial activity which further increase the function of the soil. Chemical inputs are generally reduced due to increased soil function and protection from live residues. Producers gain knowledge through workshops and working with crop consultants to maintain the success and long-term adoption of the practice. All cover crop residues are to be maintained on the surface until planting. The cover crop must be terminated before crop emergence. See complete ???NRCS Cover Crop Termination Guidelines??? for more information.

Feature Measure: acres

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $6,528.77

Scenario Cost/Unit: $65.29

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	100	$673.00
Mechanical weed control, Vegetation termination	957	Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs.	Acres	$27.07	100	$2,707.00
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	6	$263.22
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	2	$97.20
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	8	$891.60
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$12.66	100	$1,266.00
Test, Soil Health, Basic Package	2734	Basic soil health laboratory assessment for soil organic carbon, aggregation, bioavailable nitrogen, respiration, and active carbon according to technical note 450-03. Includes shipping and handling.	Number	$126.15	5	$630.75

Practice: E334A - Controlled traffic farming to reduce compaction

Scenario: #1 - Controlled traffic farming to reduce compaction

Scenario Description:
Establish a controlled traffic system where no more than 25% of the surface is tracked with heavy axel loads to minimize soil compaction. For row crops (e.g. corn in 30-inch rows) no tire should run on a row except for flotation tires on combines and/or fertilizer and lime spreading trucks. If wide flotation tires are used, they must be big enough that the inflation pressure will be below 18 psi to minimize compaction on trafficked rows.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 334 - Controlled Traffic Farming

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 334 - Controlled Traffic Farming

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $844.35

Scenario Cost/Unit: $8.44

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	10	$287.10
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	5	$557.25

Practice: E338A - Strategically planned, patch burning for grazing distribution and wildlife habitat

Scenario: #1 - Strategically planned, patch burning for grazing distribution and wildlife habitat

Scenario Description:
Patch burn grazing is the application of prescribed fires on portions of an identified grazing unit at different times of the year. Patch burn grazing allows grazing animals to select where they want to graze creating a mosaic of vegetation structures and diversity that will maintain or enhance the wildlife habitat desired for the identified wildlife species and maintain livestock production.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 338 - Prescribed Burning

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 338 - Prescribed Burning

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $783.97

Scenario Cost/Unit: $7.84

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.39	1	$116.39
Equipment Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hours	$100.26	4	$401.04
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	2	$57.42
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	4	$160.52
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	1	$48.60

Practice: E338B - Short-interval burns to promote a healthy herbaceous plant community

Scenario: #1 - Short-interval burns to promote a healthy herbaceous plant community

Scenario Description:

The controlled use of fire is applied in a forest to restore fire-adapted plants while improving wildlife habitat, wildlife food supply, and reducing the risk of damage from intense, severe wildfires. The ideal interval between prescribed burns is not often achieved. To improve the effectiveness of prescribed burning, the frequency of prescribed burning is increased appropriately, for a specified time period, to help restore ecological conditions in forests and woodlands. Short return interval prescribed burning is used to regenerate desirable tree species, improve the condition of fire-adapted plants and native herbaceous vegetation, improve wildlife food supply, create wildlife habitat (snags and den/cavity trees), limit encroachment of competing vegetation including non-native species, and reduce the future risk of damage from intense, severe wildfires.

Before Situation:

The site has a mixture of woody sprouts and some herbaceous vegetation in the forest understory.

After Situation:

The site has a mixture of warm season perennial vegetation and cool-season annual forages. Grazing is occurring to manage the herbaceous vegetation and keep undesirable woody vegetation from occupying the forest understory.

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 40.00

Scenario Total Cost: $4,750.19

Scenario Cost/Unit: $118.75

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	8	$626.40
Truck, water	1448	Water tanker truck. Equipment only. Labor not included.	Hours	$189.31	8	$1,514.48
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	24	$689.04
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	8	$321.04
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	8	$388.80
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	4	$445.80
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: E338C - Sequential patch burning

Scenario: #1 - Sequential patch burning

Scenario Description:
Conduct prescribed under burning beneath a forest canopy (ground fire), burning a portion of the area each year to create a mosaic of vegetation in several stages of development, to provide a more diverse understory and contribute to wildlife habitat. The health of conifer and oak-conifer forests, particularly longleaf pine with a characteristic herbaceous understory, is dependent on fire or another means of controlling encroaching woody vegetation. A healthy longleaf or shortleaf pine, or pine-oak forest, can support a wide array of wildlife including pollinators and several endangered or threatened species.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 338 - Prescribed Burning

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 338 - Prescribed Burning

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 10.00

Scenario Total Cost: $2,851.36

Scenario Cost/Unit: $285.14

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	2	$50.72
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	2	$36.26
Water tank, portable	1602	Portable water tank transported in a pick up truck. Typically with 200 gallon capacity includes tank with pump, hose and sprayer. Does not include the pickup truck. Equipment only.	Hours	$12.84	2	$25.68
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	16	$701.92
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	2	$57.42
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	2	$97.20
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	3	$334.35
Materials						
Fuel, ignition fuel mixture	1596	Mixture of gasoline and diesel for ignition of prescribed burns. Materials only.	Gallons	$3.71	5	$18.55
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: E340A - Cover crop to reduce soil erosion

Scenario: #1 - Cover crop to reduce soil erosion

Scenario Description:
Cover crop added to current crop rotation to reduce soil erosion from water and wind to below soil tolerance (T) level. Cover crops grown during critical erosion period(s). Species are selected that will have physical characteristics to provide adequate erosion protection.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 340 - Cover Crop

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 340 - Cover Crop

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $859.67

Scenario Cost/Unit: $8.60

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	1	$43.87
Materials						
Annual Grasses	2730	Annual grasses, one or more species, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$40.79	20	$815.80

Practice: E340B - Intensive cover cropping to increase soil health and soil organic matter content

Scenario: #1 - Intensive cover cropping to increase soil health and soil organic matter content

Scenario Description:
Implementation of cover crop mix to provide soil coverage during ALL non-crop production periods in an annual crop rotation. Cover crop shall not be harvested or burned. Planned crop rotation including cover crops and associated management activities must achieve a soil conditioning index (SCI) of zero or higher. The current NRCS wind and water erosion prediction technologies must be used to document SCI calculations.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 340 - Cover Crop

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 340 - Cover Crop

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $1,450.10

Scenario Cost/Unit: $14.50

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	2	$222.90
Materials						
Annual Grasses, Legumes or Forbs	2732	A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$61.36	20	$1,227.20

Practice: E340C - Use of multi-species cover crops to improve soil health and increase soil organic matter

Scenario: #1 - Use of multi-species cover crops to improve soil health and increase soil organic matter

Scenario Description:

Implement a multi-species cover crop to add diversity and increase biomass production to improve soil health and increase soil organic matter. Cover crop mix must include a minimum of 4 different species. The cover crop mix will increase diversity of the crop rotation by including crop types currently missing, e.g. Cool Season Grass (CSG), Cool Season Broadleaves (CSB), Warm Season Grasses (WSG), Warm Season Broadleaves (WSB).

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 340 - Cover Crop

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 340 - Cover Crop

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $1,314.94

Scenario Cost/Unit: $13.15

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	2	$87.74
Materials						
Annual Grasses, Legumes or Forbs	2732	A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$61.36	20	$1,227.20

Practice: E340D - Intensive orchard/vineyard floor cover cropping to increase soil health

Scenario: #1 - Intensive orchard/vineyard floor cover cropping to increase soil health

Scenario Description:
Implement orchard or vineyard floor cover crops. Cover crop shall not be harvested, grazed, or burned. Must achieve a soil conditioning index of zero or higher and produce a positive trend in the Organic Matter subfactor over the life of the rotation.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 340 - Cover Crop

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 340 - Cover Crop

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $1,314.94

Scenario Cost/Unit: $13.15

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	2	$87.74
Materials						
Annual Grasses, Legumes or Forbs	2732	A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$61.36	20	$1,227.20

Practice: E340E - Use of soil health assessment to assist with development of cover crop mix to improve soil health

Scenario: #1 - Use of soil health assessment to assist with development of cover crop mix to improve soil health

Scenario Description:
Soil health assessment (year 1) to evaluate current crop rotation in addressing soil organic matter depletion. Results are utilized to select a multi-species cover crop mix to add to the current crop rotation. Follow up assessment completed (year 3).

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 340 - Cover Crop

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 340 - Cover Crop

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $342.83

Scenario Cost/Unit: $3.43

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	1	$43.87
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	1	$111.45
Materials						
Annual Grasses, Legumes or Forbs	2732	A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$61.36	1	$61.36
Test, Soil Health, Basic Package	2734	Basic soil health laboratory assessment for soil organic carbon, aggregation, bioavailable nitrogen, respiration, and active carbon according to technical note 450-03. Includes shipping and handling.	Number	$126.15	1	$126.15

Practice: E340F - Cover crop to minimize soil compaction

Scenario: #1 - Cover crop to minimize soil compaction

Scenario Description:
Establish a cover crop mix that includes plants with both fibrous root and deep rooted systems. Fibrous to treat and prevent both near surface (0-4???) and deep (>4???) soil compaction and deep rooted to break up deep compacted soils. Cover crop shall not be harvested, grazed, or burned.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 340 - Cover Crop

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 340 - Cover Crop

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $1,271.07

Scenario Cost/Unit: $12.71

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	1	$43.87
Materials						
Annual Grasses, Legumes or Forbs	2732	A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$61.36	20	$1,227.20

Practice: E340G - Cover crop to reduce water quality degradation by utilizing excess soil nutrients

Scenario: #1 - Cover crop to reduce water quality degradation by utilizing excess soil nutrients

Scenario Description:
Establish a cover crop mix to take up excess soil nutrients. Select cover crop species for their ability to effectively utilize nutrients. Terminate the cover crop as late as practical to maximize plant biomass production and nutrient uptake. Cover crop shall not be harvested, grazed, or burned.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 340 - Cover Crop

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 340 - Cover Crop

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $1,271.07

Scenario Cost/Unit: $12.71

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	1	$43.87
Materials						
Annual Grasses, Legumes or Forbs	2732	A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$61.36	20	$1,227.20

Practice: E340H - Cover crop to suppress excessive weed pressures and break pest cycles

Scenario: #1 - Cover crop to suppress excessive weed pressures and break pest cycles

Scenario Description:

Establish a cover crop mix to suppress excessive weed pressures and break pest cycles. Select cover crop species for their life cycles, growth habits, and other biological, chemical and/or physical characteristics. Select cover crop species that do not harbor pests or diseases of subsequent crops in the rotation. Cover crop shall not be harvested, grazed, or burned.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 340 - Cover Crop

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 340 - Cover Crop

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $1,314.94

Scenario Cost/Unit: $13.15

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	2	$87.74
Materials						
Annual Grasses, Legumes or Forbs	2732	A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$61.36	20	$1,227.20

Practice: E340I - Using cover crops for biological strip till

Scenario: #5 - Using cover crops for biological strip till

Scenario Description:
Establish alternating strips of cover crops in which one strip acts as a biological strip-tiller and the adjacent strip promotes soil health with high residue cover crops. This will facilitate planting of the subsequent cash crop into the biologically strip-tilled row without the need for mechanical disturbance.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard 340 - Cover Crop.

After Situation:
The adoption of this enhancement will provide protection above the minimum level as described in Conservation Practice Standard 340 - Cover Crop.

Feature Measure: Acres

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $1,446.55

Scenario Cost/Unit: $14.47

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	5	$219.35
Materials						
Annual Grasses, Legumes or Forbs	2732	A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$61.36	20	$1,227.20

Practice: E340J - Cover crop to improve moisture use efficiency and reduce salts

Scenario: #5 - Cover crop to improve soil moisture use efficiency and reduce salt levels

Scenario Description:
Cover crop used in a crop rotation to reduce damaging levels of salt from parent materials and or ground water. A salt tolerant cover crop species will be planted in the salt affected zone and a buffer zone extending into the commodity crop base acres.

Before Situation:
Resources are protected at the minimum level of CPS 340 Cover Crop.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in CPS 340 Cover Crop.

Feature Measure: acres treated

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $5,025.46

Scenario Cost/Unit: $50.25

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	15	$334.05
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	12	$1,337.40
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$14.19	24	$340.56
Testing, soil sampling and EC analysis, bore hole	2055	Collecting and testing 5 soil samples per 60 inch bore hole. Inclueds EC measurements. Includes equipment and labor.	Hours	$418.61	5	$2,093.05
Annual Grasses, Legumes or Forbs	2732	A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$61.36	15	$920.40

Practice: E345A - Reduced tillage to reduce soil erosion

Scenario: #1 - Reduced tillage to reduce soil erosion

Scenario Description:
Establish a reduced tillage system to reduce soil loss. Field(s) must have a soil loss at or below the soil tolerance (T) level for water and wind erosion for the crop rotation and a Soil Tillage Intensity Rating (STIR) of no greater than 40 for each crop in the planned rotation. The current NRCS wind and water erosion prediction technologies must be used to calculate soil loss and STIR.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 345 - Residue and Tillage Management, Reduced Till

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 345 - Residue and Tillage Management, Reduced Till

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $445.80

Scenario Cost/Unit: $4.46

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	4	$445.80

Practice: E345B - Reduced tillage to reduce tillage induced particulate matter

Scenario: #1 - Reduced tillage to reduce tillage induced particulate matter

Scenario Description:

Establish a reduced tillage system to reduce tillage induced particulate matter. Field(s) must have a soil loss at or below the soil tolerance (T) level for the crop rotation and a Soil Tillage Intensity Rating (STIR) of no greater than 40 for each crop in the planned rotation. The current NRCS wind and water erosion prediction technologies must be used to document soil loss and STIR calculations.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 345 - Residue and Tillage Management, Reduced Till

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 345 - Residue and Tillage Management, Reduced Till

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $334.35

Scenario Cost/Unit: $3.34

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	3	$334.35

Practice: E345C - Reduced tillage to increase plant-available moisture

Scenario: #1 - Reduced tillage to increase plant-available moisture

Scenario Description:

Establish a reduced till system to increase plant-available moisture. Each crop in the crop rotation shall have a Soil Tillage Intensity Rating (STIR) of no greater than 80. The current NRCS wind and water erosion prediction technologies must be used to document STIR calculations. Maintain a minimum 60 percent surface residue cover throughout the year to reduce evaporation from the soil surface.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 345 - Residue and Tillage Management, Reduced Till

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 345 - Residue and Tillage Management, Reduced Till

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $334.35

Scenario Cost/Unit: $3.34

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	3	$334.35

Practice: E345D - Reduced tillage to increase soil health and soil organic matter content

Scenario: #1 - Reduced tillage to increase soil health and soil organic matter content

Scenario Description:

Establish a reduced till system to increase soil health and soil organic matter content. Each crop in the crop rotation shall have a Soil Tillage Intensity Rating (STIR) of no greater than 80. The crop rotation must achieve a soil conditioning index (SCI) of zero or higher and produce a positive trend in the Organic Matter (OM) subfactor over the life of the crop rotation. The current NRCS wind and water erosion prediction technologies must be used to document STIR and SCI calculations. Residue shall not be burned, grazed, or harvested.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 345 - Residue and Tillage Management, Reduced Till

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 345 - Residue and Tillage Management, Reduced Till

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $445.80

Scenario Cost/Unit: $4.46

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	4	$445.80

Practice: E345E - Reduced tillage to reduce energy use

Scenario: #1 - Reduced tillage to reduce energy use

Scenario Description:
Establish a reduced tillage system which reduces total energy consumption associated with field operations by at least 25% compared to conventional tillage systems (benchmark). Each crop in the crop rotation shall have a Soil Tillage Intensity Rating (STIR) of no greater than 80. The current NRCS wind and water erosion prediction technologies must be used to document STIR calculations and energy consumption.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 345 - Residue and Tillage Management, Reduced Till

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 345 - Residue and Tillage Management, Reduced Till

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $334.35

Scenario Cost/Unit: $3.34

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	3	$334.35

Practice: E372A - Switch to Renewable Power Source

Scenario: #10 - Repower with Renewable Energy Source

Scenario Description:
Existing internal combustion system (5-30 HP) used for water pumping and or movement. The repower provides the pump and drive unit replacement and the conversion to renewable energy power source, typically solar. The repowered system will function at the same capacity as the original system. Addresses Air Quality Emissions of Particulate Matter, Ozone Precursors, and Nitrous oxides.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard 372 Combustion System Improvement.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in the Conservation Practice Standard 372 Combustion System Improvement.

Feature Measure: per unit switched to renewable ene

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $62,871.49

Scenario Cost/Unit: $62,871.49

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	4	$101.44
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	16	$1,783.20
Materials						
Pump, > 5 HP to 30 HP, pump and motor, fixed cost portion	1011	Fixed cost portion of a pump between 5 and 30 HP, including the pump and motor. This portion is a base cost for the pump and is not dependent on horsepower. The total cost will include this fixed cost plus a variable cost portion. Includes material and shipping only.	Each	$3,727.95	1	$3,727.95
Solar Panels, fixed cost portion	1031	Fixed cost portion of the Solar Panels. This portion is a base cost for all Solar Panels and is not dependent on Kilowatt. The total cost of any Solar Panels will include this fixed cost plus a variable cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drops and etc.).	Each	$859.26	1	$859.26
Solar Panels, variable cost portion	1135	Variable cost portion of the Solar Panels. This portion IS dependent on the total Kilowatt for the Solar Panels. The total cost of Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drop, etc.). Includes materials only.	Kilowatt	$2,563.62	22	$56,399.64

Practice: E372B - Renewable Energy Source for Large Internal Combustion Engines

Scenario: #10 - Renewable Energy Power Source for Large IC Engines

Scenario Description:
Replace an existing pump motor with a drive unit that is powered by a renewable source such as wind, solar, geothermal, etc. that can adequately maintain the existing operating conditions, flow rates and pressures. The replacement, repower, or retrofit combustion system and related components or devices must serve the same function and perform similar type of work as the original equipment. Applies to existing, in-use agricultural combustion systems, including stationary, portable, and self-propelled mobile units. Addresses Resource Concerns for Air Quality- Particulate Matter Emissions, Ozone Precursors and Airborne Reactive Nitrogen emissions. Inefficient energy may be addressed when the IC engine is repowered with a more efficient drive unit.

Before Situation:
Resources are protected at the minimum level of Conservation Practice Standard 372 Combustion System Improvement.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level of Conservation Practice Standard 372 Combustion System Improvement.

Feature Measure: each IC system repowered

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $48,949.85

Scenario Cost/Unit: $48,949.85

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	4	$101.44
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	16	$701.92
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	8	$891.60
Materials						
Pump, > 30 HP, pump and motor, fixed cost portion	1013	Fixed cost portion of a pump greater than 30 HP, including the pump and motor. This portion is a base cost for the pump and is not dependent on horsepower. The total cost will include this fixed cost plus a variable cost portion. Includes material and shipping only.	Each	$6,467.67	1	$6,467.67
Pump, >30 HP, Pump and motor, variable cost portion	1014	Variable cost portion of a pump greater than 30 HP, including the pump and motor. This portion is dependent on the total horsepower for the pump. The total cost will include this variable cost plus a fixed cost portion. Includes material and shipping only.	Horsepower	$258.92	75	$19,419.00
Solar Panels, fixed cost portion	1031	Fixed cost portion of the Solar Panels. This portion is a base cost for all Solar Panels and is not dependent on Kilowatt. The total cost of any Solar Panels will include this fixed cost plus a variable cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drops and etc.).	Each	$859.26	1	$859.26
Solar Panels, variable cost portion	1135	Variable cost portion of the Solar Panels. This portion IS dependent on the total Kilowatt for the Solar Panels. The total cost of Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drop, etc.). Includes materials only.	Kilowatt	$2,563.62	8	$20,508.96

Practice: E373A - Dust suppressant re-application for stabilization

Scenario: #21 - Dust Suppressant Re-application, Once per Year

Scenario Description:
Limit dust emissions by maintaining the surfaces of unpaved roads and areas in a stabilized condition. The periodic re-application of dust suppressants to unpaved surface areas will limit dust generation from vehicle and machinery activities or wind action.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 373 - Dust Control on Unpaved Roads and Surfaces.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 373 - Dust Control on Unpaved Roads and Surfaces.

Feature Measure: Square Feet

Scenario Unit: Square Feet

Scenario Typical Size: 15,840.00

Scenario Total Cost: $4,463.87

Scenario Cost/Unit: $0.28

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	0.36	$2.42
Motor Grader, 200 HP	1782	Motor Grader or Maintainer, 200 hp. Typical of equipment with HP in range of 170-225. Equipment cost, does not include labor.	Hours	$166.02	3	$498.06
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	3	$120.39
Materials						
Chemical, dust control, road oil, petroleum-based	1339	Petroleum-based road oil, such as SC-250 or SC-800. Includes materials and shipping only.	Gallons	$4.27	900	$3,843.00

Practice: E376A - Modify field operations to reduce particulate matter

Scenario: #1 - Modify field operations to reduce particulate matter

Scenario Description:
Modify tillage and/or harvest operations to reduce particulates by at least 20 percent below the required levels.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 376 - Field Operations Emissions Reduction

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 376 - Field Operations Emissions Reduction

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $334.35

Scenario Cost/Unit: $3.34

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	3	$334.35

Practice: E381A - Silvopasture to improve wildlife habitat

Scenario: #1 - Silvopasture to improve wildlife habitat

Scenario Description:
Establishing a combination of trees or shrubs and compatible forages on the same acreage, providing forage, shade, and/or shelter for livestock that include a purpose of enhancing wildlife cover and shelter.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 381 - Silvopasture

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 381 - Silvopasture

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $8,606.76

Scenario Cost/Unit: $86.07

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	20	$134.60
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$19.94	200	$3,988.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	16	$459.36
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	2	$97.20
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$12.66	20	$253.20
Shrub, Seedling, Large	1508	Bare root shrub seedling, 36 to 60 inches tall; includes containerized seedlings larger than 20 cubic inches. Includes materials and shipping only.	Each	$4.01	200	$802.00
Tree, Conifer, Seedling, Large	1515	Containerized conifer seedlings, 15 or 20 cubic inches; or bare root conifer seedlings 2+1 (three-year old seedlings that grew two years in the original seedbed and another year in a transplant bed) or bare root seedlings 3+0 and older (three-year or older seedlings grown in their original seedbed, or transplanted seedlings). Includes materials and shipping only.	Each	$1.73	100	$173.00
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$134.97	20	$2,699.40

Practice: E382A - Incorporating "wildlife friendly" fencing for connectivity of wildlife food resources

Scenario: #1 - Incorporating "wildlife friendly" fencing for connectivity of wildlife food resources

Scenario Description:
Retrofitting or constructing fences that provide a means to control movement of animals, people, and vehicles, but minimizes wildlife movement impacts.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 382 - Fence

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 382 - Fence

Feature Measure: Acre

Scenario Unit: Feet

Scenario Typical Size: 1,000.00

Scenario Total Cost: $238.13

Scenario Cost/Unit: $0.24

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	1	$18.13
Materials						
Vinyl Undersill Strips	241	Marking material using the undersill strips of vinyl siding. Priced per foot of fence per each wire. Materials only.	Feet	$0.11	2000	$220.00

Practice: E382B - Installing electrical fence offsets and wire for cross-fencing to improve grazing management

Scenario: #5 - Installing electrical fence offsets and wire for cross-fencing to improve grazing management

Scenario Description:
Retrofitting conventional fences such as barb wire, with new electrical offsets and electrical wire to facilitate cross-fencing for improved grazing management.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard 382 - Fence

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard 382 - Fence

Feature Measure: Feet

Scenario Unit: Feet

Scenario Typical Size: 2,640.00

Scenario Total Cost: $1,550.72

Scenario Cost/Unit: $0.59

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	16	$701.92
Materials						
Wire, High Tensile, 12.5 Gauge, 4,000' roll	2	High Tensile 12.5 gauge, 4,000' roll. Includes materials and shipping only.	Each	$158.31	1	$158.31
Electric, Ground Rods	20	Electric, Ground Rod for electric fence. Includes materials and shipping only.	Each	$17.70	3	$53.10
Electric, Insulated cable	23	Electric, Insulated cable for electric fence. Typically in spools of 100 to 200 feet. Includes materials and shipping only.	Each	$41.90	2	$83.80
Electric, Power Surge Protector	24	Electric, Power Surge Protector for electric fence. Includes materials and shipping only.	Each	$15.48	1	$15.48
Electric, Cutoff Switch	25	Electric, Cutoff Switch for electric fence. Includes materials and shipping only.	Each	$11.17	1	$11.17
Electric, Tester	26	Electric, Tester for electric fence. Includes materials and shipping only.	Each	$46.17	1	$46.17
Electric, Energizer, 6 joule	29	Electric, Energizer, 6 joule for electric fence. Includes materials and shipping only.	Each	$427.97	1	$427.97
Fence, Wire Assembly, High Tensile, Electric, 1 Strand	32	Brace pins, springs, strainers, battens, clips, crimp sleeves, staples, insulators, wrap around sleeves. Includes materials and shipping only.	Feet	$0.02	2640	$52.80

Practice: E383A - Grazing-maintained fuel break to reduce the risk of fire

Scenario: #1 - Grazing-maintained fuel break to reduce the risk of fire

Scenario Description:
The area has existing fuel break(s) of 30 to 60 feet in width, supporting a mixture of woody sprouts and some herbaceous vegetation. Warm-season perennial vegetation will be established on the fuel breaks, and will be over-seeded with cool-season annual forages in the fall. Grazing will be managed on the fuel breaks to remove or modify the fine fuel vegetation, thus reducing the risk of fire spread from ground fires. Ground cover will be maintained to control soil erosion and facilitate prescribed burning.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 383 - Fuel Break

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 383 - Fuel Break

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 10.00

Scenario Total Cost: $3,062.98

Scenario Cost/Unit: $306.30

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$7.61	10	$76.10
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	10	$222.70
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	24	$689.04
Materials						
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	1000	$680.00
Annual Grasses, Legumes or Forbs	2732	A mix of annual grasses, legumes and/or forbs, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$61.36	10	$613.60
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$47.76	10	$477.60
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: E384A - Biochar production from woody residue

Scenario: #6 - Biochar production from woody residue

Scenario Description:
The adoption of this enhancement will go above the minimum level of woody residue treatment by creating a product that improves air quality by storing carbon, decreases fuel loads and fire hazard, and can improves soil quality. It will utilize woody debris remaining after a silvicultural practice or natural disturbance to create biochar. Biochar stores carbon and is a useful soil amendment that improves SOM and water-holding capacity.

Before Situation:
Area has woody residue that is unmerchantable and available for creation of quality biochar. Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 384 - Woody Residue Treatment

After Situation:
Woody debri has been coverted to biochar.

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 2.50

Scenario Total Cost: $13,482.05

Scenario Cost/Unit: $5,392.82

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hydraulic Excavator, .5 CY	930	Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included.	Hours	$101.18	40	$4,047.20
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	40	$252.00
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	15	$380.40
Water tank, portable	1602	Portable water tank transported in a pick up truck. Typically with 200 gallon capacity includes tank with pump, hose and sprayer. Does not include the pickup truck. Equipment only.	Hours	$12.84	80	$1,027.20
Biochar Kiln, open fire	2681	Open fire kiln or metal container used to produce biochar/charcoal production. Daily rental rate. Includes all material and equipment	Hours	$9.76	200	$1,952.00
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	40	$1,754.80
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	80	$2,296.80
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	40	$1,214.40
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	5	$557.25

Practice: E386A - Enhanced field borders to reduce soil erosion along the edge(s) of a field

Scenario: #1 - Enhanced field borders to reduce soil erosion along the edge(s) of a field

Scenario Description:
Enhance existing field borders to a width of at least 30 feet and establish a single species or mixture of species that provide a dense ground cover along the edge(s) of the field.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 386 - Field Border

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 386 - Field Border

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $1,243.27

Scenario Cost/Unit: $1,243.27

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	1	$14.88
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	1	$6.73
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	1	$22.27
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$10.18	1	$10.18
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$415.54	0.41	$170.37
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$342.50	0.36	$123.30
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acres	$272.50	0.23	$62.68
Materials						
Introduced Perennial Grasses, Legumes and/or Forbs, Medium Density	2748	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Includes material and shipping.	Acres	$68.23	1	$68.23
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: E386B - Enhanced field borders to increase carbon storage along the edge(s) of the field

Scenario: #1 - Enhanced field borders to increase carbon storage along the edge(s) of the field

Scenario Description:
Enhance existing field borders to a width of at least 30 feet and establish a single species or mixture of species that provide a dense ground cover and dense rooting system along the edge(s) of the field.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 386 - Field Border

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 386 - Field Border

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $1,328.83

Scenario Cost/Unit: $1,328.83

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	1	$14.88
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	1	$6.73
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	1	$22.27
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$10.18	1	$10.18
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$415.54	0.41	$170.37
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$342.50	0.36	$123.30
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acres	$272.50	0.23	$62.68
Materials						
Native and Introduced Perennial Grasses, Legumes and/or Forbs, Medium Density	2756	A mix of native and introduced perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to high density (41-60 pure live seeds/sq ft). Includes material and shipping.	Acres	$153.79	1	$153.79
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: E386C - Enhanced field borders to decrease particulate emissions along the edge(s) of the field

Scenario: #1 - Enhanced field borders to decrease particulate emissions along the edge(s) of the field

Scenario Description:
Enhance existing field borders to a width of at least 40 feet and establish a mixture of species that decrease the particulate emissions along the edge(s) of the field.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 386 - Field Border

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 386 - Field Border

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $1,263.74

Scenario Cost/Unit: $1,263.74

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	1	$14.88
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	1	$6.73
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	1	$22.27
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$10.18	1	$10.18
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$415.54	0.41	$170.37
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$342.50	0.36	$123.30
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acres	$272.50	0.23	$62.68
Materials						
Introduced Perennial Grasses, Legumes and/or Forbs, High Density	2749	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at high density (greater than 60 pure live seeds/sq ft). Includes material and shipping.	Acres	$88.70	1	$88.70
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: E386D - Enhanced field borders to increase food for pollinators along the edge(s) of a field

Scenario: #1 - Enhanced field borders to increase food for pollinators along the edge(s) of a field

Scenario Description:
Enhance existing field borders to a width of at least 40 feet and establish a mixture of species that provide food for pollinators along the edge(s) of the field.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 386 - Field Border

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 386 - Field Border

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $1,328.83

Scenario Cost/Unit: $1,328.83

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	1	$14.88
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	1	$6.73
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	1	$22.27
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$10.18	1	$10.18
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$415.54	0.41	$170.37
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$342.50	0.36	$123.30
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acres	$272.50	0.23	$62.68
Materials						
Native and Introduced Perennial Grasses, Legumes and/or Forbs, Medium Density	2756	A mix of native and introduced perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to high density (41-60 pure live seeds/sq ft). Includes material and shipping.	Acres	$153.79	1	$153.79
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: E386E - Enhanced field borders to increase wildlife food and habitat along the edge(s) of a field

Scenario: #1 - Enhanced field borders to increase wildlife food and habitat along the edge(s) of a field

Scenario Description:
Enhance existing field borders to a width of at least 40 feet and establish a mixture of species that provide wildlife food and habitat along the edge(s) of the field. The extended field border will also provide enhanced wildlife habitat continuity.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 386 - Field Border

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 386 - Field Border

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $1,328.83

Scenario Cost/Unit: $1,328.83

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	1	$14.88
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	1	$6.73
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	1	$22.27
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$10.18	1	$10.18
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$415.54	0.41	$170.37
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$342.50	0.36	$123.30
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acres	$272.50	0.23	$62.68
Materials						
Native and Introduced Perennial Grasses, Legumes and/or Forbs, Medium Density	2756	A mix of native and introduced perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to high density (41-60 pure live seeds/sq ft). Includes material and shipping.	Acres	$153.79	1	$153.79
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: E390A - Increase riparian herbaceous cover width for sediment and nutrient reduction

Scenario: #1 - Increase riparian herbaceous cover width for sediment and nutrient reduction

Scenario Description:
Where an existing herbaceous riparian buffer is located along a river, stream, pond, lake, or other waterbody, increase the width of the buffer in order to allow a greater percentage of sediment and nutrient removal from surface and subsurface flows.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 390 - Riparian Herbaceous Cover

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 390 - Riparian Herbaceous Cover

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 2.00

Scenario Total Cost: $1,242.09

Scenario Cost/Unit: $621.05

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	2	$13.46
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	2	$44.54
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$415.54	0.82	$340.74
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$342.50	0.72	$246.60
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acres	$272.50	0.46	$125.35
Materials						
Herbicide, Imazapyr	336	Pre and post-emergent, non-selective herbicide for control of undesirable vegetation in non-crop areas. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$42.89	2	$85.78
Native Perennial Grasses, Medium Density	2751	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Includes material and shipping.	Acres	$192.81	2	$385.62

Practice: E390B - Increase riparian herbaceous cover width to enhance wildlife habitat

Scenario: #1 - Increase riparian herbaceous cover width to enhance wildlife habitat

Scenario Description:
Where an existing herbaceous riparian buffer is located along a river, stream, pond, lake, or other waterbody, increase the diversity of native species, control invasive species, install fencing and relocate equipment operations, trails, and livestock, and increase the width of the buffer.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 390 - Riparian Herbaceous Cover

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 390 - Riparian Herbaceous Cover

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 4.00

Scenario Total Cost: $1,671.59

Scenario Cost/Unit: $417.90

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	4	$26.92
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	2	$44.54
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$415.54	1	$415.54
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$342.50	1	$342.50
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acres	$272.50	0.46	$125.35
Materials						
Herbicide, Imazapyr	336	Pre and post-emergent, non-selective herbicide for control of undesirable vegetation in non-crop areas. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$42.89	4	$171.56
Native Perennial Grasses, Legumes and/or Forbs, Medium Density	2754	A mix of native perennial grasses, legumes, and/or forbs, Grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Species typically easy to purchase. Includes material and shipping.	Acres	$272.59	2	$545.18

Practice: E391A - Increase riparian forest buffer width for sediment and nutrient reduction

Scenario: #1 - Increase riparian forest buffer width for sediment and nutrient reduction

Scenario Description:
Where an existing forested riparian area is located along a river, stream, pond, lake, or other waterbody, increase the width of the buffer in order to allow a greater percentage of sediment and nutrient removal from surface and subsurface flows.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 391 - Riparian Forest Buffer

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 391 - Riparian Forest Buffer

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 2.00

Scenario Total Cost: $4,907.66

Scenario Cost/Unit: $2,453.83

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	16	$405.76
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hours	$31.60	2	$63.20
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	2	$13.46
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$36.34	4	$145.36
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$12.51	16	$200.16
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$415.54	0.82	$340.74
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$342.50	0.72	$246.60
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acres	$272.50	0.46	$125.35
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	16	$459.36
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	4	$121.44
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	4	$194.40
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$12.66	1	$12.66
Herbicide, Sulfometuron & metsulfuron	344	A residual sulfonylurea herbicide that kills broadleaf weeds and some annual grasses. It is a systemic compound with foliar and soil activity. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$11.34	1	$11.34
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.61	1	$1.61
Tree, Hardwood, Seedling, Medium	1510	Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only.	Each	$1.74	872	$1,517.28

Tree shelter, solid tube type, 4 in. x 48 in.	1566	4 inch x 48 inch tree tube for protection from animal damage. Materials and shipping only.	Each	$5.29	100	$529.00
Stakes, wood, 1 in. x 1 in. x 48 in.	1578	1 in. x 1 in. x 48 in. wood stakes to fasten items in place. Includes materials only.	Each	$2.16	100	$216.00
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: E391B - Increase stream shading for stream temperature reduction

Scenario: #1 - Increase stream shading for stream temperature reduction

Scenario Description:
Riparian area tree canopy cover density is increased and the extent of the forested riparian area is increased to provide greater stream shading.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 391 - Riparian Forest Buffer

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 391 - Riparian Forest Buffer

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 2.00

Scenario Total Cost: $4,965.08

Scenario Cost/Unit: $2,482.54

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	16	$405.76
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hours	$31.60	2	$63.20
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	2	$13.46
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$36.34	4	$145.36
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$12.51	16	$200.16
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$415.54	0.82	$340.74
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$342.50	0.72	$246.60
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acres	$272.50	0.46	$125.35
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	18	$516.78
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	4	$121.44
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	4	$194.40
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$12.66	1	$12.66
Herbicide, Sulfometuron & metsulfuron	344	A residual sulfonylurea herbicide that kills broadleaf weeds and some annual grasses. It is a systemic compound with foliar and soil activity. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$11.34	1	$11.34
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.61	1	$1.61
Tree, Hardwood, Seedling, Medium	1510	Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only.	Each	$1.74	872	$1,517.28
Tree shelter, solid tube type, 4 in. x 48 in.	1566	4 inch x 48 inch tree tube for protection from animal damage. Materials and shipping only.	Each	$5.29	100	$529.00

Stakes, wood, 1 in. x 1 in. x 48 in.	1578	1 in. x 1 in. x 48 in. wood stakes to fasten items in place. Includes materials only.	Each	$2.16	100	$216.00
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: E391C - Increase riparian forest buffer width to enhance wildlife habitat

Scenario: #1 - Increase riparian forest buffer width to enhance wildlife habitat

Scenario Description:
Where an existing riparian forest buffer is located along a river, stream, pond, lake, or other waterbody, increase the diversity of native species, control invasive species, install fencing and relocate equipment operations, trails, and livestock to increase the functional width of the buffer.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 391 - Riparian Forest Buffer

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 391 - Riparian Forest Buffer

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 2.00

Scenario Total Cost: $4,965.08

Scenario Cost/Unit: $2,482.54

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	16	$405.76
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hours	$31.60	2	$63.20
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	2	$13.46
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$36.34	4	$145.36
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$12.51	16	$200.16
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$415.54	0.82	$340.74
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$342.50	0.72	$246.60
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acres	$272.50	0.46	$125.35
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	18	$516.78
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	4	$121.44
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	4	$194.40
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$12.66	1	$12.66
Herbicide, Sulfometuron & metsulfuron	344	A residual sulfonylurea herbicide that kills broadleaf weeds and some annual grasses. It is a systemic compound with foliar and soil activity. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$11.34	1	$11.34
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.61	1	$1.61
Tree, Hardwood, Seedling, Medium	1510	Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only.	Each	$1.74	872	$1,517.28

Tree shelter, solid tube type, 4 in. x 48 in.	1566	4 inch x 48 inch tree tube for protection from animal damage. Materials and shipping only.	Each	$5.29	100	$529.00
Stakes, wood, 1 in. x 1 in. x 48 in.	1578	1 in. x 1 in. x 48 in. wood stakes to fasten items in place. Includes materials only.	Each	$2.16	100	$216.00
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: E393A - Extend existing filter strip to reduce water quality impacts

Scenario: #1 - Extend existing filter strip to reduce water quality impacts

Scenario Description:
Extend existing filter strips for water quality protection. Extend the existing buffer for a total of 60 feet or more to enhance water quality functions. The extended buffers must be composed of at least 5 species of non-noxious, wildlife friendly grasses and/or perennial forbs best suited to site conditions. Include species that provide pollinator food and habitat where possible.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 393 - Filter Strip

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 393 - Filter Strip

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $1,551.73

Scenario Cost/Unit: $1,551.73

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	1	$14.88
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	1	$6.73
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	1	$22.27
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$10.18	1	$10.18
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$415.54	0.41	$170.37
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$342.50	0.36	$123.30
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acres	$272.50	0.23	$62.68
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	2	$222.90
Materials						
Native and Introduced Perennial Grasses, Legumes and/or Forbs, Medium Density	2756	A mix of native and introduced perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to high density (41-60 pure live seeds/sq ft). Includes material and shipping.	Acres	$153.79	1	$153.79
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: E395A - Stream habitat improvement through placement of woody biomass

Scenario: #1 - Stream habitat improvement through placement of woody biomass

Scenario Description:
Flexible placement of wood (unanchored/unpinned) in small, 1st and 2nd order streams to improve stream habitat conditions for aquatic species and natural stream processes.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 395 - Stream Habitat Improvement and Management

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 395 - Stream Habitat Improvement and Management

Feature Measure: Bankfull width X Length

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $20,406.03

Scenario Cost/Unit: $20,406.03

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hours	$145.01	16	$2,320.16
Truck, dump, 12 CY	1215	Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only.	Hours	$104.69	8	$837.52
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12 in., Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hours	$40.13	24	$963.12
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation. Includes materials, and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$28.86	20	$577.20
Aggregate, Gravel, Graded	46	Gravel. includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Cubic Yards	$30.36	30	$910.80
Compost	265	A mixture of decaying organic matter, as from leaves and manure, used to improve soil structure and provide nutrients.	Ton	$52.20	1	$52.20
Tree & Shrub, Woody, Cuttings, Large	1309	Woody pole cuttings or posts 2 to 6 inches in diameter and 6 ft. long. Includes materials and shipping only.	Each	$11.13	300	$3,339.00
Boulder	1761	Rock boulders (approximately 5 ft dia. 6.67 Tons). Includes materials and delivery (up to 100 miles) only. Placement costs are not included.	Ton	$92.25	40	$3,690.00
Steel, rebar	1832	Steel rebar, grade 60. Materials only.	Pound	$0.74	50	$37.00
Aggregate, river rock	1834	Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Ton	$25.51	15	$382.65
Log, un-anchored	2035	Price of log picked up at the Mill. Includes material only.	Ton	$176.38	30	$5,291.40
Root Wad	2045	Tree stump buried into the streambank with the roots left exposed. Includes material only.	Ton	$7.93	20	$158.60
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$923.19	2	$1,846.38

Practice: E399A - Fishpond management for native aquatic and terrestrial species

Scenario: #1 - Fishpond management for native aquatic and terrestrial species

Scenario Description:
Pond rehabilitation, buffer, and watershed management actions are taken to improve habitat for native species of fish, amphibians, and shorebirds.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 399 - Fishpond Management

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 399 - Fishpond Management

Feature Measure: Pond area + buffer area

Scenario Unit: Acres

Scenario Typical Size: 2.00

Scenario Total Cost: $3,128.74

Scenario Cost/Unit: $1,564.37

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	4	$101.44
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	1	$6.73
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acres	$22.27	1	$22.27
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	3	$131.61
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	32	$918.72
Materials						
Herbicide, Imazapyr	336	Pre and post-emergent, non-selective herbicide for control of undesirable vegetation in non-crop areas. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$42.89	1	$42.89
Herbicide, Diquat dibromide	1820	Aquatic herbicide and plant growth regulator. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Gallons	$108.55	1	$108.55
Native Aquatic Plants, Emergent or Submerged	2336	Native aquatic emergent or submerged. All required materials for establishing vegetation. Includes material and shipping.	Each	$1.22	1000	$1,220.00
Native Perennial Grasses, Legumes and/or Forbs, Medium Density	2754	A mix of native perennial grasses, legumes, and/or forbs, Grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Species typically easy to purchase. Includes material and shipping.	Acres	$272.59	1	$272.59
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: E412A - Enhance a grassed waterway

Scenario: #5 - Waterway, reshape/extend/widen

Scenario Description:

Typical practice is 1500 ' long, 12' bottom, 8:1 side slopes, 1.1' depth. A grass waterway that is a shaped or graded channel and is established with suitable vegetation to carry surface water at a non-erosive velocity to a stable outlet. This practice addresses Concentrated Flow Erosion (Classic Gully & Ephemeral Erosion) and Excessive Sediment in surface waters. Waterway area measured from top of bank to top of bank. Seeding will be completed under the Critical Area Planting (342) Practice Standard with seeding area up to 20% greater than waterway area to account for buffer area along the waterway. Costs include excavation and associated work to construct the overall shape and grade of the waterway. This scenario would apply to Grassed Waterways without erosion control blanket or rock checks.

Before Situation:

The field has a grassed waterway, but a gully cutting upstream, downstream, or adjacent to the existing grassed waterway has formed as time goes on, so the new gully needs to be stopped or controlled. The new gully has formed in field as a result of a change in runoff amounts from the original design from subsurface drainage outlets, change in cropping techniques, change in land use, etc.

After Situation:

An installed grassed waterway has been installed that is possibly wider or longer than the original grassed waterway that wasn't functioning properly anymore. The new installed grassed waterway is 1500 ' long, 12' bottom, 8:1 side slopes, 1.1' depth. The practice is installed using a dozer and/or scraper, with final grading with motor grader. Use Critical Area Planting (342) for establishment of waterway vegetation. If erosion control blankets or mulching for seedbed establishment/protection are needed, use conservation practice Mulching (484). Drainage tile, if needed, will be installed accoring to Subsurface Drain (606).

Feature Measure: Acres of Waterway reshaped, exten

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $4,022.19

Scenario Cost/Unit: $4,022.19

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yards	$0.87	411	$357.57
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yards	$3.67	954	$3,501.18
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	4	$114.84
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	1	$48.60

Practice: E420A - Establish pollinator habitat

Scenario: #5 - Establish Pollinator Habitat

Scenario Description:
Seed or plug nectar and pollen producing plants in non-cropped areas such as field borders, vegetative barriers, contour buffer strips, shelterbelts, hedgerows, windbreaks, conservation cover, and riparian forest and herbaceous buffers.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 420 - Wildlife Habitat Planting

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 420 - Wildlife Habitat Planting

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $527.23

Scenario Cost/Unit: $527.23

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	2	$57.42
Materials						
Native Perennial Grasses, Legumes and/or Forb Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, moderate commercial availability	2619	Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed is moderately easy to purchase commercially. Includes materials and shipping.	Acres	$469.81	1	$469.81

Practice: E420B - Establish monarch butterfly habitat

Scenario: #5 - Establish Monarch Habitat

Scenario Description:
Seed or plug milkweed (Asclepias spp.) and high-value monarch butterfly nectar plants on marginal cropland, field borders, contour buffer strips and similar areas.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 420 - Wildlife Habitat Planting.

After Situation:
Adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 420 - Wildlife Habitat Planting.

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $883.88

Scenario Cost/Unit: $883.88

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hours	$31.60	1	$31.60
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$81.82	2	$163.64
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acres	$10.18	1	$10.18
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	2	$97.20
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	1	$111.45
Materials						
Native Perennial Grasses, Legumes and/or Forb Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, moderate commercial availability	2619	Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed is moderately easy to purchase commercially. Includes materials and shipping.	Acres	$469.81	1	$469.81

Practice: E447A - Advanced Tailwater Recovery

Scenario: #5 - Advanced Tailwater Recovery

Scenario Description:

This enhancement is for a recovery system that capture 100% of excess irrigation and drainage runoff water from the contiguous land where the activity is implemented. Runoff water is conveyed through properly designed recovery ditches to a storage structure. Each recovery ditch and storage structure have adequate capacity to store excess irrigation water and reasonable runoff water. The system is designed to incorporate the collected water back into the delivery system so that excess water is reused. The system is fully automated to operate the recovery pumps, valves, and collection system. Key elements in the system are sensors that can evaluate data and operate devices through the system in opening/closing or on /off based on scientifically determined parameters.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard 447 - Irrigation System, Tailwater Recovery.

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard 447 - Irrigation System, Tailwater Recovery.

Feature Measure: Acres

Scenario Unit: Acres

Scenario Typical Size: 200.00

Scenario Total Cost: $1,715.84

Scenario Cost/Unit: $8.58

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	8	$202.88
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	24	$435.12
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	24	$689.04
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	8	$388.80

Practice: E449A - Complete pumping plant evaluation for water savings

Scenario: #1 - Complete pumping plant evaluation for water savings

Scenario Description:
The performance of pump tests and evaluations of all pumping plants to determine the potential to rehabilitate/replace/reconfigure pump performance to improve water delivery efficiency 10% or more. Develop and provide a written report with recordkeeping documents and list of adjustments and calculations of the reduction of water use based on before and after conditions.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 449 ??? Irrigation Water Management

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in the Conservation Practice Standard, (CPS) 449 ??? Irrigation Water Management.

Feature Measure: Each pump evaluated

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $4,099.44

Scenario Cost/Unit: $4,099.44

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	8	$350.96
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	32	$3,566.40
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08

Practice: E449B - Alternated Wetting and Drying (AWD) of rice fields

Scenario: #1 - Alternated Wetting and Drying (AWD) of rice fields

Scenario Description:
Rice fields are drained and allowed to ???dry down??? to a saturated soil condition prior to re-flooding the field. System is installed in year 1 with Scenario E449144Z8 and this scenario used in years 2-5.

Before Situation:
Resources are protected at the minimum level of the conservation Practice Standard (CPS) 449 ??? Irrigation Water Management.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in the Conservation Practice Standard (CPS) 449 ??? Irrigation Water Management.

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 40.00

Scenario Total Cost: $1,440.00

Scenario Cost/Unit: $36.00

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	40	$1,148.40
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	6	$291.60

Practice: E449C - Advanced Automated IWM - Year 2-5, soil moisture monitoring

Scenario: #1 - Advanced Automated IWM ??? Year 2-5, soil moisture monitoring

Scenario Description:
Advanced automated irrigation water management using soil moisture or water level monitoring (installed as per IWM plan) with data loggers.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 449 ??? Irrigation Water Management

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 449 - Irrigation Water Management

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 125.00

Scenario Total Cost: $2,921.20

Scenario Cost/Unit: $23.37

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	40	$1,754.80
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	24	$1,166.40

Practice: E449D - Advanced Automated IWM - Year 1, Equipment and soil moisture or water level monitoring

Scenario: #1 - Advanced Automated IWM ??? Year 1, Equipment and soil moisture or water level monitoring

Scenario Description:
Installing and monitoring soil moisture or water leveling equipment for advanced automated irrigation water management

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 449 - Irrigation Water Management

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 449 - Irrigation Water Management

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 120.00

Scenario Total Cost: $6,912.26

Scenario Cost/Unit: $57.60

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	30	$760.80
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	8	$350.96
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	16	$777.60
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	4	$445.80
Materials						
Switches and Controls, temp sensors	1192	Temperature and soil moisture sensors installed as part of an electronic monitoring (with or without wireless telecommunications) commonly used to control pumps and irrigation systems	Each	$646.73	3	$1,940.19
Data Logger with Telemetry System	1454	Data Logger W/Graphic Output for water management and telemetry - data communication device with power supply in a weather proof enclosure. Equipment only.	Each	$1,663.47	1	$1,663.47
Weather Station, Advanced	2550	Advance Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, temperature, and solar radiation from a solar powered self-standing tripod to an advance weather recording console. Used for both 449 advance irrigation water management and for Activity 202 water quality monitoring .	Each	$973.44	1	$973.44

Practice: E449E - Convert from Cascade to Furrow Irrigated Rice Production - reduce irrigation water consumption

Scenario: #5 - Convert from Cascade to Furrow Irrigated Rice Production - reduce irrigation water consumption

Scenario Description:
Field currently flooded through a cascade levee system will be converted to furrow irrigation.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard 449 - Irrigation Water Management.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard 449 - Irrigation Water Management.

Feature Measure: Acres

Scenario Unit: Acres

Scenario Typical Size: 80.00

Scenario Total Cost: $4,717.36

Scenario Cost/Unit: $58.97

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acres	$14.88	80	$1,190.40
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	32	$1,555.20
Materials						
Flow Meter, with mechanical Index	1450	10 inch, Turbine Type Flow Meter with Mechanical Index, permanently installed. Includes materials and shipping only.	Each	$1,742.08	1	$1,742.08

Practice: E449F - Intermediate IWM - Year 1, Equipment with Soil or Water Level monitoring

Scenario: #5 - Intermediate IWM - Year 1, Equipment with Soil moisture or Water Level monitoring

Scenario Description:
This activity involves monitoring soil moisture or water levels within a irrigated field for intermediate irrigation water management include installation of equipment year 1.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 449 - Irrigation Water Management

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 449 - Irrigation Water Management.

Feature Measure: Acres

Scenario Unit: Acres

Scenario Typical Size: 160.00

Scenario Total Cost: $7,617.61

Scenario Cost/Unit: $47.61

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	4	$101.44
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	4	$175.48
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	4	$194.40
Materials						
Switches and Controls, temp sensors	1192	Temperature and soil moisture sensors installed as part of an electronic monitoring (with or without wireless telecommunications) commonly used to control pumps and irrigation systems	Each	$646.73	1	$646.73
Flow Meter, with mechanical Index	1450	10 inch, Turbine Type Flow Meter with Mechanical Index, permanently installed. Includes materials and shipping only.	Each	$1,742.08	1	$1,742.08
Data Logger	1453	Data Logger W/Graphic Output for water management. Materials only.	Each	$720.50	4	$2,882.00
Soil Moisture Sensor	1456	Soil moisture resistance sensor with 10 foot cables. Equipment only.	Each	$75.17	12	$902.04
Weather Station, Advanced	2550	Advance Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, temperature, and solar radiation from a solar powered self-standing tripod to an advance weather recording console. Used for both 449 advance irrigation water management and for Activity 202 water quality monitoring .	Each	$973.44	1	$973.44

Practice: E449G - Intermediate IWM - Years 2-5, Soil or Water Level monitoring

Scenario: #5 - Intermediate IWM - Years 2-5, Soil Moisture or Water Level monitoring

Scenario Description:
Intermediate irrigation water management involves monitoring soil moisture or water levels within an irrigated field by utilizing technological equipment to gather field specific data concerning weather, soil moisture or water levels throughout the irrigation season. The equipment was bought in year one and is utilized to log data through the season to be retrieved periodically so irrigation decisions can be made based on scientific data. Maximum time between data retrieval is weekly.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 449 - Irrigation Water Management

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 449 - Irrigation Water Management.

Feature Measure: Acres

Scenario Unit: Acres

Scenario Typical Size: 160.00

Scenario Total Cost: $1,630.05

Scenario Cost/Unit: $10.19

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	15	$658.05
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	20	$972.00

Practice: E449H - Intermediate IWM - Years 2 -5, using soil moisture or water level monitoring

Scenario: #21 - Intermediate IWM - Years 2 - 5, using soil moisture or water level monitoring

Scenario Description:
Intermediate irrigation water management using soil moisture or water level monitoring with data loggers; specifically, multi-depth soil moisture sensors, water well and relift permanent flow meters, twice-daily water stage imaging water level devices, and quarter hour climate data element recording weather stations at approved IWM plan locations.

Before Situation:
Resources are protected at the minimum level of the CPS 449 - Irrigation Water Management.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 449 - Irrigation Water Management.

Feature Measure: Acres

Scenario Unit: Acres

Scenario Typical Size: 40.00

Scenario Total Cost: $1,944.00

Scenario Cost/Unit: $48.60

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	40	$1,944.00

Practice: E449I - Sprinkler Irrigation Equipment Retrofit

Scenario: #21 - IWM - Year 1, Retrofit Equipment with Speed Control on Sprinkler Irrigation

Scenario Description:
This activity involves installing speed control equipment to a sprinkler irrigated field for irrigation water management. The installation of the equipment is in year one. It is applicable to sprinkler irrigation systems that do not already have the functionality and are able to integrate the speed control technology.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 449 - Irrigation Water Management

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 449 - Irrigation Water Management.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $1,896.53

Scenario Cost/Unit: $1,896.53

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	8	$350.96
Materials						
Center Pivot VRI, Speed Control	2727	Center pivot irrigation system using variable rate irrigation using speed control technology. Includes controller, sensors, and GPS unit.	Number	$1,545.57	1	$1,545.57

Practice: E449J - Intermediate IWM - 20% Reducing Water Usage

Scenario: #5 - Intermediate IWM - 20% Reduced Water Usage

Scenario Description:
Intermediate irrigation water management involves monitoring soil moisture or water levels within an irrigated field by utilizing technological equipment to gather field specific data concerning weather, soil moisture or water levels throughout the irrigation season. The equipment will be utilized to log data through the season to be retrieved periodically so irrigation decisions can be made based on scientific data. Maximum time between data retrieval is weekly.Monitoring will be for the entire irrigation season and data gathered will be used to make sound decisions on irrigation water use.Supplimental Water usage will be reduced by 20% from previous years use and remain at that level for the remainder of the contract.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 449 ??? Irrigation Water Management.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in the Conservation Practice Standard (CPS) 449 ??? Irrigation Water Management.

Feature Measure: Irrigated Acres

Scenario Unit: Acres

Scenario Typical Size: 125.00

Scenario Total Cost: $4,720.71

Scenario Cost/Unit: $37.77

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	8	$350.96
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	32	$3,566.40
Materials						
Soil Moisture Meter	1455	Soil Moisture Sensor Reader. Equipment only.	Each	$245.42	1	$245.42
Soil Moisture Sensor	1456	Soil moisture resistance sensor with 10 foot cables. Equipment only.	Each	$75.17	5	$375.85
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08

Practice: E472A - Manage livestock access to waterbodies to reduce nutrients or pathogens to surface water

Scenario: #1 - Manage livestock access to waterbodies to reduce nutrients or pathogens to surface water

Scenario Description:
Installation of structures and implementation of grazing management actions that restrict livestock access to streams, ditches, and other waterbodies in order to reduce nutrient loading or reduce the introduction of pathogens from manure, bio-solids or compost to surface waters.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 472 - Access Control

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 472 - Access Control

Feature Measure: (Stream length protected * 2) + ((C

Scenario Unit: Feet

Scenario Typical Size: 1,320.00

Scenario Total Cost: $4,086.32

Scenario Cost/Unit: $3.10

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hours	$9.89	5	$49.45
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	5	$126.80
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$36.34	5	$181.70
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	33	$947.43
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	5	$151.80
Materials						
Wire, Barbed, Galvanized, 12.5 Gauge, 1,320' roll	1	Galvanized 12.5 gauge, 1,320' roll. Includes materials and shipping only.	Each	$125.50	4	$502.00
Post, Wood, CCA treated, 3-4 in. x 7 ft.	9	Wood Post, Line 3-4 inch dia. X 7 ft., CCA Treated. Includes materials and shipping only.	Each	$11.38	20	$227.60
Post, Wood, CCA treated, 6 in. x 8 ft.	12	Wood Post, End 6 inch dia. X 8 ft., CCA Treated. Includes materials and shipping only.	Each	$25.26	8	$202.08
Post, Steel T, 1.33 lbs, 6 ft.	15	Steel Post, Studded 6 ft. - 1.33 lb. Includes materials and shipping only.	Each	$7.23	90	$650.70
Fence, Wire Assembly, Barbed Wire	30	Brace pins, battens, clips, staples. Includes materials and shipping only.	Feet	$0.20	1320	$264.00
Gate, Pipe, 12 ft.	1057	6 rail tube gate, 16 gauge. Includes materials and shipping only.	Each	$239.41	2	$478.82
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: E484A - Mulching to improve soil health

Scenario: #1 - Mulching to improve soil health

Scenario Description:
Implement a crop rotation which utilizes mulch and addresses all four principle components of soil health: increases diversity of the cropping system; maintains residue throughout the year; keeps a living root; and minimizes soil chemical, physical and biological disturbance. Plant-based mulching materials will be applied at least once during the rotation. The rotation will include at least 4 different crops and/or cover crops grown in a sequence that will produce a positive trend in the Organic Matter (OM) subfactor value over the life of the rotation, as determined by the Soil Conditioning Index (SCI). The current NRCS wind and water erosion prediction technologies must be used to document the rotation and SCI calculations.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 484 - Mulching

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 484 - Mulching

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $222.90

Scenario Cost/Unit: $2.23

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	2	$222.90

Practice: E484B - Reduce particulate matter emissions by using orchard or vineyard generated woody materials as mulch

Scenario: #1 - Reduce particulate matter emissions by using orchard or vineyard generated woody materials as mulch

Scenario Description:
Reduce particulate matter emissions by using orchard or vineyard generated woody materials as mulch. At least 90% of all woody materials are to be used as mulch on the operation. An exception may be made when it is determined that infected material must be burned to preserve crop health.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 484 ??? Mulching

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 484 - Mulching

Feature Measure: Actual Acres of Crop producing Wo

Scenario Unit: Acres

Scenario Typical Size: 40.00

Scenario Total Cost: $675.48

Scenario Cost/Unit: $16.89

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	4	$445.80

Practice: E484C - Mulching with natural materials in specialty crops for weed control

Scenario: #5 - Mulching with natural materials in specialty crops for weed control

Scenario Description:
Application of straw mulch or other state approved natural material (such as wood chips, compost, green chop, dry hay or sawdust) for weed control in specialty crops.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard 484 - Mulching

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard 484 - Mulching

Feature Measure: Acres

Scenario Unit: Acres

Scenario Typical Size: 10.00

Scenario Total Cost: $617.99

Scenario Cost/Unit: $61.80

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$36.34	2	$72.68
Mulcher, straw blower	1305	Straw bale mulcher/blower to mechanically spread small or large straw bales. Labor not included.	Hours	$83.82	2	$167.64
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	2	$60.72
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	1	$111.45
Materials						
Straw	1237	Small grain straw (non organic and certified organic). Includes materials only.	Ton	$137.00	1.5	$205.50

Practice: E484D - Lowbush Blueberry Field Mulching for Moisture Management

Scenario: #5 - Lowbush blueberry field mulching

Scenario Description:
Full-field application of state-approved natural material such as wood chips for moisture retention to enhance resilience in low bush blueberries (aka wild blueberries).

Before Situation:
Resources are protected at the minimum level of CPS 484 Mulching. 484 Mulching is typically used to fill bare spots on wild blueberry fields, which encourages 'blueberry sod' to migrate into de-vegetated areas, stabilizing the soil. Blueberry field (barrens) are typically situated in excessively drained soils in locations where irrigation is not generally feasible. Increasing incidence of drought each year is stressing plants and negatively impacting yields.

After Situation:
Wood chips are applied to a depth of 2 inches field-wide using typical dry manure spreading equipment. Wood chips hold precipitation in the root zone, preventing moisture loss in excessively-drained soils, and add organic matter into the system, improving soil quality over time.

Feature Measure: acres

Scenario Unit: Acres

Scenario Typical Size: 10.00

Scenario Total Cost: $143,711.10

Scenario Cost/Unit: $14,371.11

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Manure, compost, application	955	Loading, hauling and spreading manure/compost by ground equipment. Includes equipment, power unit and labor costs.	Hours	$137.30	45	$6,178.50
Aggregate, Wood Chips	1098	Includes materials, equipment and labor to transport and place.	Cubic Yards	$50.92	2700	$137,484.00
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	1	$48.60

Practice: E511A - Harvest of crops (hay or small grains) using measures that allow desired species to flush or escape

Scenario: #1 - Harvest of crops (hay or small grains) using measures that allow desired species to flush or escape

Scenario Description:
Harvest of crops (hay or small grains) using conservation measures that allow desired species to flush or escape. (For species list see State Wildlife Action Plan) Conservation measures include timing of harvest, idling land during the nesting or fawning period, and applying harvest techniques that reduce mortality to wildlife.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 511 - Forage Harvest Management

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 511 - Forage Harvest Management

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 50.00

Scenario Total Cost: $227.29

Scenario Cost/Unit: $4.55

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Foregone Income						
FI, Hay, General Grass	2122	General Grass Hay is Primary Land Use	Ton	$49.18	1.67	$82.13
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	2	$87.74
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	2	$57.42

Practice: E511B - Forage harvest management that helps maintain wildlife habitat cover, shelter or continuity

Scenario: #1 - Forage harvest management that helps maintain wildlife habitat cover, shelter or continuity

Scenario Description:
The timely cutting and removal of forages from the field as hay, green-chop, or ensilage in such a way, and in time frames, to optimize both forage yield/quality and wildlife cover and shelter and/or continuity between otherwise disconnected habitats.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 511 - Forage Harvest Management

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 511 - Forage Harvest Management

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $547.10

Scenario Cost/Unit: $5.47

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$19.94	25	$498.50
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	1	$48.60

Practice: E511C - Forage testing for improved harvesting methods and hay quality

Scenario: #5 - Hay quality record keepoing for livestock producers

Scenario Description:

This enhancement results in participants obtaining hay samples and submitting them to a land grant university or other accredited lab for quality analysis. The participant will record data for multiple harvests and use the data to make future decisions. The participant will discuss the results with NRCS or with their cooperative extensions service. Technical recommendations are made to the participant based upon the test results.

Before Situation:

The participant has hay that doesn't have quality analysis or doesn't know the quality of previous hay harvests. The hay will be fed when needed.

After Situation:

The participant has hay with hay quality analysis. The participant records data based upon the results to reference and make future decisions. The participant has a better understanding on the quality of hay so that adjustments in feeding or supplementation can be made.

Feature Measure: Each

Scenario Unit: Number

Scenario Typical Size: 2.00

Scenario Total Cost: $279.09

Scenario Cost/Unit: $139.55

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	2	$57.42
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	1	$48.60
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	1	$111.45
Materials						
Test, Feed Analysis	1989	Representative sample of feed. Includes materials and shipping only.	Each	$30.81	2	$61.62

Practice: E511D - Forage Harvest Management to Improve Terrestrial Habitat for Wildlife during Over-Winter Periods

Scenario: #5 - Forage Harvest Management Overwinter

Scenario Description:
Eliminate or forgo the last fall cutting of hay or haylage to optimize wildlife cover and shelter during critical over-winter periods and lengthen late season bloom period for invertebrates. Allowing late season stand maturity increases stand life and reduces risks of frost and winter damage while providing valuable wildlife habitat and an extended bloom periods.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 511-Forage Harvest Management

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in CPS - 511

Feature Measure: Acres

Scenario Unit: Acres

Scenario Typical Size: 40.00

Scenario Total Cost: $1,098.95

Scenario Cost/Unit: $27.47

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.39	1	$116.39
Equipment Installation						
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$75.12	3	$225.36
Foregone Income						
FI, Hay, Alfalfa	2121	Alfalfa Hay is Primary Crop	Ton	$103.89	3	$311.67
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	3	$91.08
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	5	$243.00
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	1	$111.45

Practice: E512A - Cropland conversion to grass-based agriculture to reduce soil erosion

Scenario: #1 - Cropland conversion to grass-based agriculture to reduce soil erosion

Scenario Description:
Conversion of cropped land to grass-based agriculture to reduce soil erosion. Mixtures of perennial grasses, forbs, and legume species are established on cropland where annually-seeded cash crops have been grown.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $1,052.40

Scenario Cost/Unit: $10.52

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	2	$97.20
Materials						
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$47.76	20	$955.20

Practice: E512B - Forage and biomass planting to reduce soil erosion or increase organic matter to build soil health

Scenario: #1 - Forage and biomass planting to reduce soil erosion or increase organic matter to build soil health

Scenario Description:
Establishing adapted and/or compatible species, varieties, or cultivars of herbaceous species suitable for pasture, hay, or biomass production that can provide for reduced soil erosion, improving soil health.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $2,796.60

Scenario Cost/Unit: $27.97

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	2	$97.20
Materials						
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$134.97	20	$2,699.40

Practice: E512C - Cropland conversion to grass for soil organic matter improvement

Scenario: #1 - Cropland conversion to grass for soil organic matter improvement

Scenario Description:
Conversion of cropped land to grass-based agriculture. Mixtures of perennial grasses, forbs, and/or legume species are established on cropland where annually-seeded cash crops have been grown.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $1,458.42

Scenario Cost/Unit: $14.58

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	2	$57.42
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	4	$445.80
Materials						
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$47.76	20	$955.20

Practice: E512D - Forage plantings that help increase organic matter in depleted soils

Scenario: #1 - Forage plantings that help increase organic matter in depleted soils

Scenario Description:
Establishing adapted and/or compatible species, varieties, or cultivars of herbaceous species suitable for pasture, hay, or biomass production that can help improve soil quality of depleted sites through increase or conservation of the organic matter in the soil.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $1,550.90

Scenario Cost/Unit: $15.51

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$19.94	25	$498.50
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	2	$97.20
Materials						
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$47.76	20	$955.20

Practice: E512I - Establish pollinator and/or beneficial insect and/or monarch habitat

Scenario: #1 - Establish pollinator and/or beneficial insect and/or monarch habitat

Scenario Description:
Establishing adapted and/or compatible species, varieties, or cultivars of herbaceous species that can provide nectar for Monarch butterflies and/or pollinators and forage and other habitat values for wildlife and livestock, particularly at times when targeted nectar, forage supply and quality, cover, and shelter are not available in other pastures.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $2,948.80

Scenario Cost/Unit: $29.49

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	2	$222.90
Materials						
Native Perennial Grasses, Legumes and/or Forbs, Medium Density	2754	A mix of native perennial grasses, legumes, and/or forbs, Grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Species typically easy to purchase. Includes material and shipping.	Acres	$272.59	10	$2,725.90

Practice: E512J - Establish wildlife corridors to provide habitat continuity or access to water

Scenario: #1 - Establish wildlife corridors to provide habitat continuity or access to water

Scenario Description:
Establishing adapted and/or compatible species, varieties, or cultivars of perennial, herbaceous species that can provide cover needed for wildlife species of concern to move from food/cover/water sources to other food/cover/water sources as needed for their life cycles, and/or to enhance the utility of underused wildlife habitat areas.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 512 - Forage and Biomass Planting

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $1,945.40

Scenario Cost/Unit: $19.45

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$19.94	25	$498.50
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	2	$97.20
Materials						
Native Perennial Grasses, Low Density	2750	Native perennial grasses, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$134.97	10	$1,349.70

Practice: E512L - Diversifying Forage Base with Interseeding Forbs and Legumes to Increase Pasture Quality

Scenario: #5 - Diversifying forage base with interseeding forbs and legumes to increase pasture quality.

Scenario Description:
Establishing adapted and/or compatible species, varieties, or cultivars of perennial, herbaceous species that increases the diversity to enhance livestock, forage supply and quality, not available in other pastures

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 512 Pasture and Hay Planting

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in the Conservation Practice Standard (CPS) 512 Pasture and Hay Planting

Feature Measure: acres treated

Scenario Unit: Acres

Scenario Typical Size: 50.00

Scenario Total Cost: $4,669.42

Scenario Cost/Unit: $93.39

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hours	$31.60	8	$252.80
Seeding Operation, Broadcast, Ground	959	Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs.	Acres	$14.02	50	$701.00
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$19.94	50	$997.00
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	2	$87.74
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	8	$242.88
Materials						
Introduced Perennial Grasses, Legumes and/or Forbs, Low Density	2747	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Includes material and shipping.	Acres	$47.76	50	$2,388.00

Practice: E512M - Forage Plantings that Improve Wildlife Habitat Cover and Shelter or Structure and Composition

Scenario: #5 - Forage plantings that improve wildlife habitat cover and shelter or structure and composition

Scenario Description:
Establishing native adapted and/or compatible species, varieties, or cultivars of herbaceous species for pasture, hay, or biomass production that provide cover and shelter or structure and composition for wilddlife.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 512 Pasture and Hay Planting

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in the Conservation Practice Standard (CPS) 512 Pasture and Hay Planting

Feature Measure: Acres

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $5,812.04

Scenario Cost/Unit: $58.12

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	2	$87.74
Materials						
Native Perennial Grasses, Legumes and/or Forbs, Low Density	2753	A mix of native perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Species typically easy to purchase. Includes material and shipping.	Acres	$190.81	30	$5,724.30

Practice: E528A - Maintaining quantity and quality of forage for animal health and productivity

Scenario: #1 - Maintaining quantity and quality of forage for animal health and productivity

Scenario Description:
Managing the harvest of vegetation with grazing and/or browsing animals for the purposes of maintaining desired pasture composition/plant vigor and improving/maintaining quantity and quality of forage for the animals' health and productivity following the recommendations of a qualifying professional, as detailed in the documentation and implementation requirements.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 1,000.00

Scenario Total Cost: $4,103.97

Scenario Cost/Unit: $4.10

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.39	1	$116.39
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	4	$101.44
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	12	$217.56
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$19.94	36	$717.84
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	17	$488.07
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	2	$97.20
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	12	$1,337.40
Materials						
Wire, Polywire	8	Wire, Polywire for electric fence - 1,300 ft. Includes materials and shipping only.	Each	$47.57	1	$47.57
Electric, Energizer, Solar	27	Electric, Energizer, Solar for electric fence. Includes materials and shipping only.	Each	$363.74	1	$363.74
Tank, Polyethylene, 300 gallon	291	Portable heavy duty rubber stock tank.	Each	$340.34	1	$340.34
Nutritional Balance Analyzer, fecal sample analysis only	1127	NIRS fecal analysis, animal performance report. Includes materials and shipping only.	Each	$46.07	6	$276.42

Practice: E528B - Grazing management that improves monarch butterfly habitat

Scenario: #1 - Grazing management that improves monarch butterfly habitat

Scenario Description:
Implement a grazing management plan that will increase the abundance and diversity of monarch nectar-producing perennial forbs, including milkweed, while maintaining ecosystem benefits for other wildlife and livestock.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $1,018.60

Scenario Cost/Unit: $10.19

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.39	1	$116.39
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$19.94	2.5	$49.85
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	1	$28.71
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	1	$48.60
Materials						
Wire, Polywire	8	Wire, Polywire for electric fence - 1,300 ft. Includes materials and shipping only.	Each	$47.57	1	$47.57
Electric, Energizer, Solar	27	Electric, Energizer, Solar for electric fence. Includes materials and shipping only.	Each	$363.74	2	$727.48

Practice: E528C - Incorporating wildlife refuge areas in contingency plans for wildlife.

Scenario: #1 - Incorporating wildlife refuge areas in contingency plans for wildlife.

Scenario Description:
A prescribed grazing plan that includes 12 month (or longer) rest (non-grazing period equal or greater than one year) of a grazing unit that consists of native grasses and/or legumes and/or perennial forbs for the purpose of meeting the needs for drought/disaster contingency plans that will also provide wildlife habitat or wildlife access to water for a period of time.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $1,796.23

Scenario Cost/Unit: $17.96

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.39	1	$116.39
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	2	$50.72
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	6	$108.78
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$19.94	15	$299.10
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	2	$97.20
Materials						
Wire, Polywire	8	Wire, Polywire for electric fence - 1,300 ft. Includes materials and shipping only.	Each	$47.57	4	$190.28
Electric, Energizer, Solar	27	Electric, Energizer, Solar for electric fence. Includes materials and shipping only.	Each	$363.74	1	$363.74
Tank, Polyethylene, 300 gallon	291	Portable heavy duty rubber stock tank.	Each	$340.34	1	$340.34

Practice: E528D - Grazing management for improving quantity and quality of food or cover and shelter for wildlife

Scenario: #1 - Grazing management for improving quantity and quality of food or cover and shelter for wildlife

Scenario Description:
Grazing management employed will provide the plant structure, density and diversity needed for improving the quantity and quality of cover, shelter and food for the desired wildlife species of concern.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 1,000.00

Scenario Total Cost: $602.39

Scenario Cost/Unit: $0.60

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.39	1	$116.39
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	10	$486.00

Practice: E528E - Improved grazing management for enhanced plant structure and composition for wildlife

Scenario: #1 - Improved grazing management for enhanced plant structure and composition for wildlife

Scenario Description:
Managing the harvest of vegetation with grazing and/or browsing animals for the purpose of improving the quantity and quality of the structure and composition of the plant community that is available for wildlife.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $347.70

Scenario Cost/Unit: $3.48

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$19.94	15	$299.10
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	1	$48.60

Practice: E528F - Stockpiling cool season forage to improve structure and composition or plant productivity and health

Scenario: #1 - Stockpiling cool season forage to improve structure and composition or plant productivity and health

Scenario Description:
Grazing management employed to stop grazing events of selected paddock(s) to allow pasture forages to grow to maximum vegetative biomass accumulation before the end of the growing season.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $2,956.39

Scenario Cost/Unit: $29.56

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.39	1	$116.39
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	2	$50.72
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	6	$108.78
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$19.94	10	$199.40
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	2	$97.20
Materials						
Wire, Polywire	8	Wire, Polywire for electric fence - 1,300 ft. Includes materials and shipping only.	Each	$47.57	1	$47.57
Electric, Energizer, Solar	27	Electric, Energizer, Solar for electric fence. Includes materials and shipping only.	Each	$363.74	1	$363.74
Nitrogen (N), Urea	71	Price per pound of N supplied by Urea. Price is not per pound of total product applied, no conversion is needed.	Pound	$0.68	2000	$1,360.00
Tank, Polyethylene, 300 gallon	291	Portable heavy duty rubber stock tank.	Each	$340.34	1	$340.34
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$14.19	3	$42.57

Practice: E528G - Improved grazing management on pasture for plant productivity and health with monitoring activities

Scenario: #1 - Improved grazing management on pasture for plant productivity and health with monitoring activities

Scenario Description:
Managing the harvest of vegetation with grazing and/or browsing animals as adjusted when following recommendations of a qualifying professional, as detailed in the enhancement criteria, generated through pasture condition scoring (PCS).

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $1,058.19

Scenario Cost/Unit: $10.58

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$19.94	30	$598.20
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	4	$445.80
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$14.19	1	$14.19

Practice: E528H - Prescribed grazing to improve/maintain riparian and watershed function-elevated water temperature

Scenario: #1 - Prescribed grazing to improve/maintain riparian and watershed function-elevated water temperature

Scenario Description:
Grazing management employed will provide cover and density needed in the watershed in order to reduce runoff, improve infiltration, provide for above ground water filtration and sustain applicable fish and wildlife species habitat.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 1,000.00

Scenario Total Cost: $1,772.31

Scenario Cost/Unit: $1.77

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.39	1	$116.39
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	4	$101.44
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	12	$217.56
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	17	$488.07
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	2	$97.20
Materials						
Wire, Polywire	8	Wire, Polywire for electric fence - 1,300 ft. Includes materials and shipping only.	Each	$47.57	1	$47.57
Electric, Energizer, Solar	27	Electric, Energizer, Solar for electric fence. Includes materials and shipping only.	Each	$363.74	1	$363.74
Tank, Polyethylene, 300 gallon	291	Portable heavy duty rubber stock tank.	Each	$340.34	1	$340.34

Practice: E528I - Grazing management that protects sensitive areas -surface or ground water from nutrients

Scenario: #1 - Grazing management that protects sensitive areas -surface or ground water from nutrients

Scenario Description:
Grazing management employed will provide cover and density needed in the watershed in order to protect sensitive areas such as sinkholes, streams, highly erodible areas, or locations with plants that cannot tolerate defoliation.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 1,000.00

Scenario Total Cost: $1,991.82

Scenario Cost/Unit: $1.99

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.39	1	$116.39
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	4	$101.44
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	12	$217.56
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	17	$488.07
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	2	$97.20
Materials						
Wire, Polytape	7	Wire, Polytape for electric fence. Rolls of 655' to 825'. Includes materials and shipping only.	Each	$66.77	4	$267.08
Electric, Energizer, Solar	27	Electric, Energizer, Solar for electric fence. Includes materials and shipping only.	Each	$363.74	1	$363.74
Tank, Polyethylene, 300 gallon	291	Portable heavy duty rubber stock tank.	Each	$340.34	1	$340.34

Practice: E528J - Prescribed grazing on pastureland that improves riparian and watershed function

Scenario: #1 - Prescribed grazing on pastureland that improves riparian and watershed function

Scenario Description:
Grazing management employed will provide cover and density needed in the watershed in order to reduce runoff, improve infiltration, provide for above ground water filtration and sustain applicable fish and wildlife species habitat.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $1,696.53

Scenario Cost/Unit: $16.97

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.39	1	$116.39
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	2	$50.72
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	6	$108.78
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$19.94	10	$199.40
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	2	$97.20
Materials						
Wire, Polywire	8	Wire, Polywire for electric fence - 1,300 ft. Includes materials and shipping only.	Each	$47.57	4	$190.28
Electric, Energizer, Solar	27	Electric, Energizer, Solar for electric fence. Includes materials and shipping only.	Each	$363.74	1	$363.74
Tank, Polyethylene, 300 gallon	291	Portable heavy duty rubber stock tank.	Each	$340.34	1	$340.34

Practice: E528L - Prescribed grazing that improves or maintains riparian and watershed function-erosion

Scenario: #1 - Prescribed grazing that improves or maintains riparian and watershed function-erosion

Scenario Description:
Grazing management employed will provide cover and density needed in the watershed in order to reduce runoff, improve infiltration, provide for above ground water filtration and sustain applicable fish and wildlife species habitat.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $1,111.40

Scenario Cost/Unit: $11.11

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.39	1	$116.39
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$19.94	10	$199.40
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	10	$287.10
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	2	$97.20
Materials						
Wire, Polywire	8	Wire, Polywire for electric fence - 1,300 ft. Includes materials and shipping only.	Each	$47.57	1	$47.57
Electric, Energizer, Solar	27	Electric, Energizer, Solar for electric fence. Includes materials and shipping only.	Each	$363.74	1	$363.74

Practice: E528M - Grazing management that protects sensitive areas from gully erosion

Scenario: #1 - Grazing management that protects sensitive areas from gully erosion

Scenario Description:
Grazing management employed will provide vegetative cover and density needed in the watershed in order to protect sensitive areas such as sinkholes, streams, highly erodible areas, or locations that cannot tolerate plant defoliation.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 1,000.00

Scenario Total Cost: $1,791.51

Scenario Cost/Unit: $1.79

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.39	1	$116.39
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	4	$101.44
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	12	$217.56
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	17	$488.07
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	2	$97.20
Materials						
Wire, Polytape	7	Wire, Polytape for electric fence. Rolls of 655' to 825'. Includes materials and shipping only.	Each	$66.77	1	$66.77
Electric, Energizer, Solar	27	Electric, Energizer, Solar for electric fence. Includes materials and shipping only.	Each	$363.74	1	$363.74
Tank, Polyethylene, 300 gallon	291	Portable heavy duty rubber stock tank.	Each	$340.34	1	$340.34

Practice: E528N - Improved grazing management through monitoring activities

Scenario: #1 - Improved grazing management through monitoring activities

Scenario Description:
Three predominant key grazing areas are evaluated utilizing the Rangeland Health Assessment (where reference material is developed) or Describing Indicators of Rangeland Health protocols (where reference material is not developed) to determine how well the ecological processes of the site(s) are functioning. Utilizing knowledge learned from this as a part of the ranch resource assessment, a qualifying professional, as detailed in the enhancement criteria, will provide recommendations or follow-up evaluations toward mitigating some of the degradation risks that are initially identified.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 528 - Prescribed Grazing

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 1,000.00

Scenario Total Cost: $2,080.33

Scenario Cost/Unit: $2.08

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.39	1	$116.39
Equipment Installation						
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	8	$145.04
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	10	$287.10
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	4	$194.40
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	12	$1,337.40

Practice: E528O - Clipping mature forages to set back vegetative growth for improved forage quality

Scenario: #5 - Clipping mature forages to set back vegetative growth for improved forage quality

Scenario Description:
Timely clipping of mature forages through mowing, swathing or some other mechanical cutting will occur to increase forage palatability by setting plants back to a vegetative state for improved grazing management and forage quality.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard 528 - Prescribed Grazing

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard 528 - Prescribed Grazing

Feature Measure: Acres

Scenario Unit: Acres

Scenario Typical Size: 80.00

Scenario Total Cost: $3,723.82

Scenario Cost/Unit: $46.55

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Mechanical cutter, chopper	943	Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included.	Hours	$116.89	20	$2,337.80
Rangeland/grassland field monitoring kit	967	Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only.	Each	$49.50	1	$49.50
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	24	$728.64
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	2	$607.88

Practice: E528P - Implementing Bale or Swath Grazing to increase organic matter and reduce nutrients in surface water

Scenario: #5 - Implementing bale or swath grazing to increase organic matter or reduce nutrients in surface water

Scenario Description:
Bale or swath grazing to improve organic matter, aggregate stability or soil organism habitat or to reduce nutrient risks to surface water by leaving field harvested forages on site or supplementing with off-field forages. Grazing forages in this manner, will help reduce nutrient concentrations from confined animal lots while incorporating organic matter, feeding and diversifying the microbiome, building better soil aggregation and increasing soil health.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard 528 - Prescribed Grazing

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard 528 - Prescribed Grazing

Feature Measure: Acres

Scenario Unit: Acres

Scenario Typical Size: 20.00

Scenario Total Cost: $3,556.84

Scenario Cost/Unit: $177.84

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	20	$507.20
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$75.12	20	$1,502.40
Trailer, flatbed, small	1505	Small flatbed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included.	Hours	$10.36	20	$207.20
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	40	$1,214.40
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	1	$111.45
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$14.19	1	$14.19

Practice: E528Q - Use of body condition scoring for livestock on a monthly basis to keep track of herd health

Scenario: #5 - Use of body condition scoring for livestock on a monthly basis to keep track of herd health

Scenario Description:

Body condition scoring (BCS) serves as a useful management tool to monitor livestock performance with respect to current and recent feeding or grazing programs. Body condition scoring is a numeric scoring system, producers can use to consistently evaluate animals??? estimated body energy reserves through degree of fatness. This information can be used to adjust nutritional strategies to reach optimal BCS. Since body condition is closely associated with reproductive performance as well as feed efficiency, monitoring body condition can help producers reach production goals and increase the operation???s bottom line. Knowledge and understanding of BCS will assist producers to adjust a supplemental feeding program to maintain animal health and nutrition on a-monthly-basis.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard 528 - Prescribed Grazing

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard 528 - Prescribed Grazing

Feature Measure: Acres

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $184.02

Scenario Cost/Unit: $1.84

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.39	1	$116.39
Equipment Installation						
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	1	$18.13
Rangeland/grassland field monitoring kit	967	Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only.	Each	$49.50	1	$49.50

Practice: E528R - Management Intensive Rotational Grazing

Scenario: #5 - Management Intensive Rotational Grazing

Scenario Description:
Management intensive, multi-paddock grazing system where livestock are regularly and systematically moved to fresh forage to optimize quantity and quality of forage growth, improve manure distribution, improve wildlife cover, and improve soil health.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard 528 - Prescribed Grazing

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard 528 - Prescribed Grazing

Feature Measure: Acres

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $4,169.18

Scenario Cost/Unit: $41.69

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.39	1	$116.39
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	2	$50.72
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	10	$181.30
Rangeland/grassland field monitoring kit	967	Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only.	Each	$49.50	1	$49.50
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	15	$430.65
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	2	$97.20
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	6	$668.70
Materials						
Wire, Polywire	8	Wire, Polywire for electric fence - 1,300 ft. Includes materials and shipping only.	Each	$47.57	2	$95.14
Electric, Ground Rods	20	Electric, Ground Rod for electric fence. Includes materials and shipping only.	Each	$17.70	3	$53.10
Electric, Ground Rod Clamps	21	Electric, Ground Rod Clamps for electric fence. Includes materials and shipping only.	Each	$2.53	3	$7.59
Electric, Tester	26	Electric, Tester for electric fence. Includes materials and shipping only.	Each	$46.17	1	$46.17
Electric, Energizer, Solar	27	Electric, Energizer, Solar for electric fence. Includes materials and shipping only.	Each	$363.74	1	$363.74
Tank, Polyethylene, 300 gallon	291	Portable heavy duty rubber stock tank.	Each	$340.34	2	$680.68
Pipe, HDPE, smooth wall, weight priced	1379	High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only.	Pound	$3.59	370	$1,328.30

Practice: E528S - Soil Health Improvements on Pasture

Scenario: #5 - Soil health improvements on pasture

Scenario Description:
Use of soil health assessment to evaluate impact of current grazing system in addressing soil organic matter depletion, soil aggregate instability and soil organism habitat loss or degradation (primary assessment made in Year 1). Modifications to the grazing system will be made after the laboratory analysis. Modifications can be improvements to the grazing plan or changes to the forage composition. During year 4, a follow-up assessment will be completed to allow time for the modifications to show improvements to the soil health resource concerns. The follow-up sample will be taken in the same soil type, closely matched to time of year and with similar amounts of regrowth since previous grazing.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (PCS) 528 - Prescribed Grazing

Feature Measure: Acres

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $1,049.21

Scenario Cost/Unit: $10.49

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.39	1	$116.39
Equipment Installation						
Rangeland/grassland field monitoring kit	967	Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only.	Each	$49.50	1	$49.50
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$19.94	12	$239.28
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	4	$114.84
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	6	$291.60
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	1	$111.45
Materials						
Test, Soil Health, Basic Package	2734	Basic soil health laboratory assessment for soil organic carbon, aggregation, bioavailable nitrogen, respiration, and active carbon according to technical note 450-03. Includes shipping and handling.	Number	$126.15	1	$126.15

Practice: E528T - Grazing to Reduce Wildfire Risk on Forests

Scenario: #5 - Improved grazing management for reduction of wildfire risks on Western forests

Scenario Description:
Managing the harvest of vegetation with grazing and/or browsing animals for the purpose of balancing forage with maintaining/improving ecological site condition and while reducing the risk of wildfire hazard on forested ecological sites.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level with the addition of CPS 528 - Prescribed Grazing

Feature Measure: acres

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $136.34

Scenario Cost/Unit: $1.36

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	2	$87.74
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	1	$48.60

Practice: E528U - Contingency Planning for Resiliency

Scenario: #5 - Contingency Planning for Resiliency

Scenario Description:
Manage grazing throughout the year to mitigate impacts from drought and improve resiliency by incorporating recovery periods, utilizing non-traditional grazing resources, and creating a drought plan.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 528 - Prescribed Grazing.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in CPS - 528.

Feature Measure: acres

Scenario Unit: Acres

Scenario Typical Size: 1,000.00

Scenario Total Cost: $7,350.18

Scenario Cost/Unit: $7.35

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.39	2	$232.78
Equipment Installation						
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	20	$362.60
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	80	$2,296.80
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	40	$4,458.00

Practice: E533A - Advanced Pumping Plant Automation

Scenario: #5 - Advanced Pumping Plant Automation

Scenario Description:
This enhancement consists of installing a control device to a pump station that allows the user to remotely monitor and operate the pump station based on field measured data. Pumping stations may have either a combustible or electric power unit that are compatible with the control device or sensor. These devices/sensors collect field-measured data and provide this data in real time to the landowner to make irrigation decisions and adjustments to the pump operation.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard 533 - Pumping Plant.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard 533 - Pumping Plant.

Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $6,751.24

Scenario Cost/Unit: $6,751.24

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	4	$101.44
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	4	$175.48
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	4	$114.84
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	4	$445.80
Materials						
Solar Panels, fixed cost portion	1031	Fixed cost portion of the Solar Panels. This portion is a base cost for all Solar Panels and is not dependent on Kilowatt. The total cost of any Solar Panels will include this fixed cost plus a variable cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drops and etc.).	Each	$859.26	1	$859.26
Solar Panels, variable cost portion	1135	Variable cost portion of the Solar Panels. This portion IS dependent on the total Kilowatt for the Solar Panels. The total cost of Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drop, etc.). Includes materials only.	Kilowatt	$2,563.62	0.1	$256.36
Switches and Controls, temp sensors	1192	Temperature and soil moisture sensors installed as part of an electronic monitoring (with or without wireless telecommunications) commonly used to control pumps and irrigation systems	Each	$646.73	1	$646.73
Switches and Controls, programmable controller	1193	Programmable logic controller (with or without wireless telecommunications) commonly used to control pumps and irrigation systems	Each	$623.08	1	$623.08
Switches and Controls, Wi-Fi system and software	1194	Software with built-in cellular or Wi-Fi communication commonly used to control pumps and irrigation systems	Each	$786.92	1	$786.92
Switches and Controls, radio system	1195	Output radio, field transmitter, and receiver commonly used to control pumps and irrigation systems	Each	$789.40	1	$789.40
Data Logger with Telemetry System	1454	Data Logger W/Graphic Output for water management and telemetry - data communication device with power supply in a weather proof enclosure. Equipment only.	Each	$1,663.47	1	$1,663.47
Safety Camera on Automated Pump	2474	Waterproof outdoor wireless IP Network security camera with housing. Includes materials only.	Each	$218.03	1	$218.03
Engine/Fuel Tank Sensor	2487	Transducer and sensors to monitor the oil pressure, oil and water temperatures, fuel flow meter with digital pulse output and fuel levels in a tank. Includes the conduit and cabling.	Each	$70.43	1	$70.43

Practice: E533B - Complete pumping plant evaluation for energy savings

Scenario: #1 - Complete pumping plant evaluation for energy savings

Scenario Description:
The performance of pump tests and evaluations of all pumping plants to determine the potential to rehabilitate/replace/reconfigure pump performance to reduce energy use. Evaluate to determine if a Variable Frequency Drive motor controller(s) will reduce energy use and is feasible. Develop and provide a written report with list of adjustments and calculations of the reduction of energy use based on before and after conditions.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 533 - Pumping Plant

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 533 - Pumping Plant

Feature Measure: Each pump evaluated

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $4,099.44

Scenario Cost/Unit: $4,099.44

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	8	$350.96
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	32	$3,566.40
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08

Practice: E533C - Install VFDs on pumping plants

Scenario: #7 - Install variable frequency drive on pump

Scenario Description:
Install Variable Frequency Drive(s) (VFD) on Pumping Plant with the correct sensors, on all pumps as indicated in the evaluation.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 533 ??? Pumping Plant.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in the Conservation Practice Standard, (CPS) 533 ??? Pumping Plant.

Feature Measure: Each pump modified

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $7,153.28

Scenario Cost/Unit: $7,153.28

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	4	$101.44
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	12	$526.44
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	2	$222.90
Materials						
Variable Speed Drive, 50 HP	1288	Variable speed drive for 50 Horsepower electric motor. Does not include motor. Materials only.	Horsepower	$126.05	50	$6,302.50

Practice: E533D - Switch fuel source for pumps

Scenario: #7 - Switch fuel source for pumps

Scenario Description:
Switch the fuel source for pump motor(s) to an on-farm renewable source (wind, solar, geothermal, etc.)

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 533 ??? Pumping Plant.

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in the Conservation Practice Standard, (CPS) 533 ??? Pumping Plant.

Feature Measure: Each pump modified

Scenario Unit: Number

Scenario Typical Size: 1.00

Scenario Total Cost: $18,426.66

Scenario Cost/Unit: $18,426.66

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	4	$101.44
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	12	$526.44
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	2	$222.90
Materials						
Pump, <= 5 HP, pump and motor, fixed cost portion	1009	Fixed cost portion of a pump less than or equal to 5 HP pump and motor. This portion is the base cost and is not dependent on horsepower. The total cost of any pump will include this fixed cost plus a variable cost portion. Includes the motor and controls for materials and shipping only.	Each	$1,659.42	1	$1,659.42
Pump, <= 5 HP, pump and motor, variable cost portion	1010	Variable cost portion of a pump less than or equal to 5 HP pump and motor. This portion is dependent on the total horsepower for the pump. The total cost of any pump will include this variable cost plus the fixed cost portion. Includes the motor and controls for materials and shipping only.	Horsepower	$447.82	5	$2,239.10
Solar Panels, fixed cost portion	1031	Fixed cost portion of the Solar Panels. This portion is a base cost for all Solar Panels and is not dependent on Kilowatt. The total cost of any Solar Panels will include this fixed cost plus a variable cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drops and etc.).	Each	$859.26	1	$859.26
Solar Panels, variable cost portion	1135	Variable cost portion of the Solar Panels. This portion IS dependent on the total Kilowatt for the Solar Panels. The total cost of Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drop, etc.). Includes materials only.	Kilowatt	$2,563.62	5	$12,818.10

Practice: E550A - Range planting for increasing/maintaining organic matter

Scenario: #1 - Range planting for increasing/maintaining organic matter

Scenario Description:
Establishment of adapted perennial or self-sustaining vegetation such as grasses, forbs, legumes, shrubs and trees for the purpose of increasing or maintaining organic matter levels in the soil.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 550 - Range Planting

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 550 - Range Planting

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $4,485.15

Scenario Cost/Unit: $44.85

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	Animal Unit Month	$19.94	15	$299.10
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	2	$97.20
Materials						
Native Perennial Grasses, Legumes and/or Forbs, Medium Density	2754	A mix of native perennial grasses, legumes, and/or forbs, Grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Species typically easy to purchase. Includes material and shipping.	Acres	$272.59	15	$4,088.85

Practice: E550B - Range planting for improving forage, browse, or cover for wildlife

Scenario: #1 - Range planting for improving forage, browse, or cover for wildlife

Scenario Description:
Establishment of adapted perennial or self-sustaining vegetation such as grasses, forbs, legumes, shrubs and trees for the purpose of improving forage, browse, or cover for wildlife on areas that have been degraded beyond recovery via ecological principles, or old crop fields and pastures devoid of desirable, native rangeland species that fit within an ecological site description steady state.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 550 - Range Planting

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 550 - Range Planting

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $2,131.00

Scenario Cost/Unit: $21.31

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	2	$222.90
Materials						
Native Perennial Grasses, Legumes and/or Forbs, Low Density	2753	A mix of native perennial grasses, legumes, and/or forbs, grasses typically greater than 50% of the mix, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at lower to medium density (40 pure live seeds/sq ft and less). Species typically easy to purchase. Includes material and shipping.	Acres	$190.81	10	$1,908.10

Practice: E570A - Enhanced rain garden for wildlife

Scenario: #5 - Enhanced rain garden for wildlife

Scenario Description:
Seed or plug nectar and pollen producing plants into rain gardens to provide wildlife habitat.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard 570 - Stormwater Runoff Control

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard 570 - Stormwater Runoff Control

Feature Measure: Square Feet

Scenario Unit: Square Feet

Scenario Typical Size: 1,080.00

Scenario Total Cost: $238.62

Scenario Cost/Unit: $0.22

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	1	$25.36
Site Preparation, Mechanical	944	Aerator, rolling drum chopper, etc. Includes equipment, power unit and labor costs.	Acres	$89.37	0.1	$8.94
Seeding Operation, Broadcast, Ground	959	Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs.	Acres	$14.02	0.1	$1.40
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	4	$114.84
Materials						
Straw	1237	Small grain straw (non organic and certified organic). Includes materials only.	Ton	$137.00	0.3	$41.10
Native Perennial Grasses, Legumes and/or Forb Mix for Targeted Wildlife/Pollinator Habitat or Ecological Restoration, moderate commercial availability	2619	Diverse mix of native perennial grasses, legumes and forbs, less than 50% grasses, may include biennials and a small percentage of annual species for establishment purposes and/or if allowed by the CPS. This is a mix composed of species required to meet specific wildlife/pollinator habitat or ecological requirements. Seed is moderately easy to purchase commercially. Includes materials and shipping.	Acres	$469.81	0.1	$46.98

Practice: E578A - Stream crossing elimination

Scenario: #1 - Stream crossing elimination

Scenario Description:
Existing stream crossings on an operation are consolidated into fewer crossings in order to reduce impacts to stream habitat.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 578 - Stream Crossing

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 578 - Stream Crossing

Feature Measure: Typical feature is 0.09 acres

Scenario Unit: Each

Scenario Typical Size: 1.00

Scenario Total Cost: $9,890.05

Scenario Cost/Unit: $9,890.05

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$78.30	16	$1,252.80
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hours	$130.51	8	$1,044.08
Seeding Operation, Broadcast, Ground	959	Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs.	Acres	$14.02	0.1	$1.40
Truck, dump, 12 CY	1215	Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only.	Hours	$104.69	16	$1,675.04
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	32	$918.72
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	32	$971.52
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	16	$777.60
Materials						
Erosion Control Blanket, biodegradable	1213	Biodegradable erosion control blanket, typically a composite of natural fibers with reinforcing polymer netting. Materials and shipping only.	Square Yard	$1.65	300	$495.00
Tree & Shrub, Woody, Cuttings, Medium	1308	Woody cuttings, live stakes or whips typically 1/4 to 1 inch diameter and 24 to 48 inches long. Includes materials and shipping only.	Each	$2.01	300	$603.00
Aggregate, river rock	1834	Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery within 20 miles of quarry or pit. Placement costs are not included.	Ton	$25.51	42	$1,071.42
Annual Grasses	2730	Annual grasses, one or more species, mostly introduced but may be native. Used for temporary cover or cover crops. Includes material and shipping.	Acres	$40.79	0.1	$4.08
Introduced Perennial Grasses, Legumes and/or Forbs, Medium Density	2748	Introduced perennial grasses, legumes, and/or forbs, may include a small percentage of annual species for establishment purposes and/or if allowed by the CPS. Planted at medium to higher density (41-60 pure live seeds/sq ft). Includes material and shipping.	Acres	$68.23	0.1	$6.82
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: E580A - Stream corridor bank stability improvement

Scenario: #1 - Stream corridor bank stability improvement

Scenario Description:
Stream corridor bank vegetation components are established to provide additional streambank stability.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 580 - Streambank and Shoreline Protection

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 580 - Streambank and Shoreline Protection

Feature Measure: Area planted

Scenario Unit: Acres

Scenario Typical Size: 2.00

Scenario Total Cost: $4,516.01

Scenario Cost/Unit: $2,258.01

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	8	$202.88
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	8	$145.04
Trailer, enclosed, small	1503	Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included.	Hours	$14.56	8	$116.48
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$12.51	8	$100.08
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	48	$1,378.08
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	8	$388.80
Materials						
Shrub, Potted, Small	1524	Potted shrub seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$7.79	65	$506.35
Tree, Hardwood, Potted, Small	1529	Potted hardwood seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$4.91	65	$319.15
Tree, Conifer, Potted, Small	1534	Potted conifer seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$5.08	65	$330.20
Tree shelter, mesh tree tube, 48 in.	1556	48 inch tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only.	Each	$1.54	65	$100.10
Tree shelter, solid tube type, 4 in. x 24 in.	1563	4 inch x 24 inch tree tube for protection from animal damage. Materials and shipping only.	Each	$2.52	65	$163.80
Tree shelter, solid tube type, 4 in. x 48 in.	1566	4 inch x 48 inch tree tube for protection from animal damage. Materials and shipping only.	Each	$5.29	65	$343.85
Stakes, wood, 1 in. x 1 in. x 48 in.	1578	1 in. x 1 in. x 48 in. wood stakes to fasten items in place. Includes materials only.	Each	$2.16	195	$421.20

Practice: E580B - Stream corridor bank vegetation improvement

Scenario: #1 - Stream corridor bank vegetation improvement

Scenario Description:
Stream corridor bank vegetation components are established to improve ecosystem functioning and stability.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 580 - Streambank and Shoreline Protection

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 580 - Streambank and Shoreline Protection

Feature Measure: Area planted

Scenario Unit: Acres

Scenario Typical Size: 2.00

Scenario Total Cost: $4,516.01

Scenario Cost/Unit: $2,258.01

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	8	$202.88
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	8	$145.04
Trailer, enclosed, small	1503	Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included.	Hours	$14.56	8	$116.48
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$12.51	8	$100.08
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	48	$1,378.08
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	8	$388.80
Materials						
Shrub, Potted, Small	1524	Potted shrub seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$7.79	65	$506.35
Tree, Hardwood, Potted, Small	1529	Potted hardwood seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$4.91	65	$319.15
Tree, Conifer, Potted, Small	1534	Potted conifer seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$5.08	65	$330.20
Tree shelter, mesh tree tube, 48 in.	1556	48 inch tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only.	Each	$1.54	65	$100.10
Tree shelter, solid tube type, 4 in. x 24 in.	1563	4 inch x 24 inch tree tube for protection from animal damage. Materials and shipping only.	Each	$2.52	65	$163.80
Tree shelter, solid tube type, 4 in. x 48 in.	1566	4 inch x 48 inch tree tube for protection from animal damage. Materials and shipping only.	Each	$5.29	65	$343.85
Stakes, wood, 1 in. x 1 in. x 48 in.	1578	1 in. x 1 in. x 48 in. wood stakes to fasten items in place. Includes materials only.	Each	$2.16	195	$421.20

Practice: E590A - Improving nutrient uptake efficiency and reducing risk of nutrient losses

Scenario: #1 - Improving nutrient uptake efficiency and reducing risk of nutrient losses

Scenario Description:

Nutrient management encompasses managing the amount, source, placement, and timing of the application of plant nutrients and soil amendments. Nutrients are currently being applied on the farm based on the 4R nutrient stewardship principles. Enhanced nutrient use efficiency strategies or technologies are utilized to improve nutrient use efficiency and reduce risk of nutrient losses to surface and groundwater and reduce risks to air quality by reducing emissions of greenhouse gases (GHGs).

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 590 - Nutrient Management

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 590 - Nutrient Management

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $1,396.05

Scenario Cost/Unit: $13.96

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	2	$222.90
Materials						
Nitrogen-Urease inhibitor	260	Nitrogen-Urease inhibitor	Acres	$11.13	100	$1,113.00
Test, Soil Nitrogen Testing	311	Pre-Side Dress/Deep Soil Testing. Includes materials and shipping only.	Each	$12.03	5	$60.15

Practice: E590B - Reduce risks of nutrient loss to surface water by utilizing precision agriculture technologies

Scenario: #1 - Reduce risks of nutrient loss to surface water by utilizing precision agriculture technologies

Scenario Description:
Precision application technology and techniques are utilized to plan and apply nutrients to improve nutrient use efficiency and reduce risk of nutrient losses.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 590 - Nutrient Management

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 590 - Nutrient Management

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $1,635.55

Scenario Cost/Unit: $16.36

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Fertilizer, precision application	952	Fertilizer application performed by light bar/GPS navigation system. Includes equipment, power unit and labor costs.	Acres	$9.16	100	$916.00
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	2	$222.90
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$14.19	35	$496.65

Practice: E590C - Improving nutrient uptake efficiency and reducing risk of nutrient losses on pasture

Scenario: #5 - Improving nutrient uptake efficiency and reducing risk of nutrient losses on pasture

Scenario Description:
Nutrient management encompasses managing the amount, source, placement, and timing of the application of plant nutrients and soil amendments. Nutrients are currently being applied on the farm based on the 4R nutrient stewardship principles. Enhanced nutrient use efficiency strategies or technologies are utilized to improve nutrient use efficiency and reduce risk of nutrient losses on pasture.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard 590 - Nutrient Management

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard 590 - Nutrient Management

Feature Measure: Acres

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $1,929.40

Scenario Cost/Unit: $19.29

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Fertilizer, precision application	952	Fertilizer application performed by light bar/GPS navigation system. Includes equipment, power unit and labor costs.	Acres	$9.16	100	$916.00
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	4	$445.80
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$14.19	40	$567.60

Practice: E590D - Reduce nutrient loss by increasing setback awareness via precision technology for water quality

Scenario: #5 - Reduce risks of nutrient losses to surface and groundwater by increasing setback awareness via precision technology

Scenario Description:

Precision technology and techniques are used to increase Soil/Groundwater Setbacks & Associated Application Rate Restrictions (SGS&AARR) implementation during nutrient application by providing precise, real-time location information (geo-located) in the field to the equipment operator. While operating nutrient application equipment, the operator???s location is continually updated and displayed on an add-on GPS-enabled device visible to the operator at all times to reduce the risk of nutrient application in setback and/or sensitive areas. Resource concerns addressed are Water Quality, Field sediment, nutrient and pathogen loss: Nutrients transported to groundwater and surface water and Pathogens and chemicals from manure, biosolids or compost applications transported to groundwater and surface water.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 590 - Nutrient Management.

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 590 - Nutrient Management.

Feature Measure: Acres with setback for nutrient app

Scenario Unit: Acres

Scenario Typical Size: 300.00

Scenario Total Cost: $4,173.71

Scenario Cost/Unit: $13.91

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.39	2	$232.78
Equipment Installation						
Fertilizer, precision application	952	Fertilizer application performed by light bar/GPS navigation system. Includes equipment, power unit and labor costs.	Acres	$9.16	300	$2,748.00
Aerial Imagery	966	Aerial imagery. RBG (color), infrared or NDVI single image.	Acres	$1.77	260	$460.20
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	4	$175.48
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	5	$557.25

Practice: E595A - Reduce risk of pesticides in surface water by utilizing precision pesticide application techniques

Scenario: #1 - Reduce risk of pesticides in surface water by utilizing precision pesticide application techniques

Scenario Description:
Utilize precision application techniques to reduce risk of pesticides in surface water by reducing total amount of chemical applied and reducing the potential for delivery of chemicals into water bodies.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 595 - Integrated Pest Management

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 595 - Integrated Pest Management

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $1,208.35

Scenario Cost/Unit: $12.08

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chemical, precision application	949	Chemical application performed by light bar/GPS navigation system. Includes equipment, power unit and labor costs.	Acres	$8.74	100	$874.00
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	3	$334.35

Practice: E595B - Reduce risk of pesticides in water and air by utilizing IPM PAMS techniques

Scenario: #1 - Reduce risk of pesticides in water and air by utilizing IPM PAMS techniques

Scenario Description:
Utilize integrated pest management (IPM) prevent, avoidance, monitoring, and suppression (PAMS) techniques to reduce risk of pesticides in water and air. Reduce the potential for delivery of chemicals into water or ozone precursor emissions .

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 595 - Integrated Pest Management

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 595 - Integrated Pest Management

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $773.05

Scenario Cost/Unit: $7.73

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	10	$438.70
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	3	$334.35

Practice: E595D - Increase the size requirement of refuges planted to slow pest resistance to Bt crops

Scenario: #1 - Increase the size requirement of refuges planted to slow pest resistance to Bt crops

Scenario Description:
Bacillus thuringiensis (Bt) plant incorporated protectants are plants that have been genetically altered to produce proteins that are harmful to certain insect pests. Widespread implementation of Bt crops has decreased insecticide use and increased crop yields, but it must be used as part of an integrated pest management (IPM) approach to protect the crop from pest species that are not susceptible to the Bt toxin and to manage pest resistance. Crop rotation, scouting and resistance management strategies, such as planting and creating refuges of non-Bt crops, are essential when farming Bt crops. Insects have developed resistance to Bt proteins. To mitigate the development of further resistance, growers are required to plant refuges of non-transgenic crops. These refuges produce numbers of susceptible insects that will help sustain populations of non-resistant insects. The size of Refuge requirement depends on the environment, pest and strain of the crop. Size of refuge is determined by resistance risk. Most Bt corn requires that 20% of the total Bt crop planted be non-Bt. Cotton can require 50% of the crop be planted to non-Bt. A recent study published in the Journal of Integrated Pest Management revealed, compliance has been a challenge. Nearly 40% of growers surveyed did not plant the required refuge (Reisig 2017). They credit non-compliance, in part, to lack of understanding by small-scale farmers about the need for refuges.

Before Situation:
Minimal or no refuges were planted as required for Bt crops.

After Situation:
Optimum sized and located refuges are planted for Bt crops.

Feature Measure: Ac

Scenario Unit: Acres

Scenario Typical Size: 40.00

Scenario Total Cost: $661.60

Scenario Cost/Unit: $16.54

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	10	$438.70
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	2	$222.90

Practice: E595E - Eliminate use of chemical treatments to control pests and to increase the presence of dung beetles

Scenario: #1 - Eliminate use of chemical treatments to control pests and to increase the presence of dung beetles

Scenario Description:

Pests and parasites can have a significant impact on the economic viability of livestock operations, by affecting the performance and health of animals. The use of broad-spectrum insecticides, pour-ons and avermectins have been shown to have a detrimental effect on dung beetle populations. Having a healthy population of dung beetles facilitates the recycling of nutrients and promotes soil and grassland health. By eliminating the application of broad-spectrum insecticides, pour-ons, and avermectins, including injectable avermectins, for pest control in and on livestock along with rotational grazing and higher stock densities has shown to increase the dung beetle population. Use of natural or alternative methods of pest control over multiple years is encouraged.

Before Situation:

Pests and parasites can have a significant impact on the economic viability of livestock operations, by affecting the performance and health of animals. The use of broad-spectrum insecticides, pour-ons and avermectins have been shown to have a detrimental

After Situation:

Having a healthy population of dung beetles facilitates the recycling of nutrients and promotes soil and grassland health. By eliminating the application of broad-spectrum insecticides, pour-ons, and avermectins, including injectable avermectins, for pest

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 500.00

Scenario Total Cost: $3,186.47

Scenario Cost/Unit: $6.37

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.39	1	$116.39
Equipment Installation						
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	26	$471.38
Rangeland/grassland field monitoring kit	967	Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only.	Each	$49.50	1	$49.50
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	10	$438.70
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	10	$287.10
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	10	$486.00
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	12	$1,337.40

Practice: E595F - Improving Soil Organism Habitat on Agricultural Land

Scenario: #5 - Improving soil organism habitat on agricultural land

Scenario Description:

To reduce or eliminate the use of seed treatments in corn and soybean cropping systems to promote beneficial organism populations and pest control. Beneficial organisms such as the Carabidae beetle are very important in the population control of common agricultural pests like the grey garden slug. Slugs are a common pest in no-till and heavily cover cropped fields. Slugs are mollusks and can ingest some treatments with no adverse effects. Beneficial organism populations can be negatively impacted when they consume slugs exposed to seed treatments. The reduction or elimination of routine seed treatments in these cash crop systems may increase beneficial insect populations.

Before Situation:

Seed treatments are used on crops.

After Situation:

Producers effectively reduce or eliminate seed treatment use in their cropping rotations either by eliminating seed treatments on corn-soybean rotations or eliminating seed treatments on corn.

Feature Measure: Acres Planted

Scenario Unit: Acres

Scenario Typical Size: 50.00

Scenario Total Cost: $557.25

Scenario Cost/Unit: $11.15

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	5	$557.25

Practice: E595G - Reduced resistance risk by utilizing PAMS techniques

Scenario: #5 - Reduced resistance risk by utilizing PAMS techniques

Scenario Description:
Design and implementation of an integrated pest management plan that will Utilize integrated pest management (IPM) prevention, avoidance, monitoring, and suppression (PAMS) techniques to reduce pesticide resistance and address plant pest pressure. Increased resistance leads to increased use of more toxic pesticides and increased risk of delivery of chemicals to water or ozone precursor emissions.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 595 ??? Pest Management Conservation Systems

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level described in Conservation practice Standard (CPS) 595 Pest Management Conservation System.

Feature Measure: Acres

Scenario Unit: Acres

Scenario Typical Size: 100.00

Scenario Total Cost: $1,562.01

Scenario Cost/Unit: $15.62

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$116.39	1	$116.39
Equipment Installation						
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	4	$72.52
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	10	$287.10
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	4	$194.40
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	8	$891.60

Practice: E612B - Planting for high carbon sequestration rate

Scenario: #6 - Planting for high carbon storage rate

Scenario Description:
Plant tree species and use stocking levels for higher growth to increase the rate of carbon sequestration (capture). Use species with a longer life span as well as relatively fast growth, and species suitable for durable manufactured products. Increase stocking levels in forests that are not fully stocked. Implement afforestation on appropriate open lands.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 612 - Tree/Shrub Establishment

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 612 - Tree/Shrub Establishment

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 5.00

Scenario Total Cost: $13,377.47

Scenario Cost/Unit: $2,675.49

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	9	$228.24
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$81.82	5	$409.10
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$12.51	54	$675.54
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	54	$1,550.34
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	9	$437.40
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	4	$445.80
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$12.66	5	$63.30
Herbicide, Sulfometuron & metsulfuron	344	A residual sulfonylurea herbicide that kills broadleaf weeds and some annual grasses. It is a systemic compound with foliar and soil activity. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$11.34	5	$56.70
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.61	5	$8.05
Tree, Hardwood, Seedling, Small	1509	Bare root hardwood seedlings 6 to 18 inches tall; includes tropical containerized seedlings of 8 cubic inches or smaller. Includes materials and shipping only.	Each	$0.95	1075	$1,021.25
Tree shelter, solid tube type, 4 in. x 60 in.	1567	4 inch x 60 inch tree tube for protection from animal damage. Materials and shipping only.	Each	$6.67	1075	$7,170.25
Cable ties, plastic	1575	Plastic cable ties (typ. 8-12 in.) to assist in securing items. Materials only.	Each	$0.07	3225	$225.75
Stakes, wood, 1 in. x 1 in. x 36 in.	1577	1 in. x 1 in. x 36 in. wood stakes to fasten items in place. Includes materials only.	Each	$1.01	1075	$1,085.75

Practice: E612C - Establishing tree/shrub species to restore native plant communities

Scenario: #1 - Establishing tree/shrub species to restore native plant communities

Scenario Description:

Establish trees and/or shrubs to restore elements of plant diversity that have been lost through past diseases or improper management. For example, disease-resistant varieties of elm and chestnut can be established to restore the ecological functions of American elm and American chestnut. At the stand level, past forest management may have eliminated certain native tree species. Restoring stand-level diversity and function addresses a wide array of resource concerns and strengthens ongoing management activities. This enhancement improves a forest that is already in good condition by increasing plant diversity, and improving health and vigor through adding plants with resistance to disease, pests, or other local hazards. Additional benefits include contributing to carbon storage, and providing diversity in wildlife habitat and food sources.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 612 - Tree/Shrub Establishment

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 612 - Tree/Shrub Establishment

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 5.00

Scenario Total Cost: $5,224.16

Scenario Cost/Unit: $1,044.83

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	2	$50.72
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$12.51	12	$150.12
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	12	$344.52
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	4	$445.80
Materials						
Shrub, Potted, Small	1524	Potted shrub seedling, 1 quart to 1 gallon. Includes materials and shipping only.	Each	$7.79	50	$389.50
Tree, Hardwood, Potted, Medium	1532	Potted hardwood seedling, 2 gallons or larger. Includes materials and shipping only.	Each	$14.28	100	$1,428.00
Tree, Conifer, Potted, Medium	1537	Potted conifer seedling, 2 gallons or larger. Includes materials and shipping only.	Each	$14.15	100	$1,415.00
Tree shelter, solid tube type, 4 in. x 60 in.	1567	4 inch x 60 inch tree tube for protection from animal damage. Materials and shipping only.	Each	$6.67	150	$1,000.50

Practice: E612D - Adding food-producing trees and shrubs to existing plantings

Scenario: #1 - Adding food-producing trees and shrubs to existing plantings

Scenario Description:
Plant food-producing trees and shrubs for wildlife within windbreaks, alley cropping, multi-story cropping, silvopasture systems, and/or riparian forest buffers.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 612 - Tree/Shrub Establishment

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 612 - Tree/Shrub Establishment

Feature Measure: Acres

Scenario Unit: Acres

Scenario Typical Size: 10.00

Scenario Total Cost: $2,460.41

Scenario Cost/Unit: $246.04

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	2	$50.72
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	1	$6.73
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	10	$181.30
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$12.51	10	$125.10
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$415.54	0.41	$170.37
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$342.50	0.36	$123.30
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acres	$272.50	0.23	$62.68
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	10	$287.10
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$12.66	1	$12.66
Herbicide, Sulfometuron & metsulfuron	344	A residual sulfonylurea herbicide that kills broadleaf weeds and some annual grasses. It is a systemic compound with foliar and soil activity. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$11.34	1	$11.34
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.61	1	$1.61
Shrub, Seedling, Medium	1507	Bare root shrub seedling, 18 to 36 inches tall; includes tropical containerized seedlings 10 to 20 cubic inches. Includes materials and shipping only.	Each	$1.56	341	$531.96
Tree, Hardwood, Seedling, Medium	1510	Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only.	Each	$1.74	340	$591.60
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: E612E - Cultural plantings

Scenario: #1 - Cultural plantings

Scenario Description:
Plant trees and shrubs that are of cultural significance, such as those species utilized by Tribes in traditional practices, medicinal plants, species used in basket-making, etc. (e.g., paper birch, slippery elm, witch hazel).

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 612 - Tree/Shrub Establishment

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 612 - Tree/Shrub Establishment

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $2,340.49

Scenario Cost/Unit: $2,340.49

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	2	$50.72
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	1	$6.73
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$12.51	10	$125.10
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$415.54	0.41	$170.37
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$342.50	0.36	$123.30
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acres	$272.50	0.23	$62.68
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	10	$287.10
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$12.66	1	$12.66
Herbicide, Sulfometuron & metsulfuron	344	A residual sulfonylurea herbicide that kills broadleaf weeds and some annual grasses. It is a systemic compound with foliar and soil activity. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$11.34	1	$11.34
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.61	1	$1.61
Tree, Hardwood, Seedling, Medium	1510	Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only.	Each	$1.74	681	$1,184.94
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: E612F - Sugarbush management

Scenario: #1 - Sugarbush management

Scenario Description:
Establish or maintain species diversity in a sugarbush to enhance pollinator and wildlife needs. Maintain at least 20% of basal area in species other than sugar maple (Acer saccharum) to provide species diversity. Half of the trees that are not sugar maples (10%) will be mast producing species (hard or soft mass). Use maple tree tapping guidelines that minimize tree damage.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 612 - Tree/Shrub Establishment

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 612 - Tree/Shrub Establishment

Feature Measure: Acres

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $935.39

Scenario Cost/Unit: $935.39

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	2	$12.60
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	2	$50.72
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$81.82	1	$81.82
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$12.51	2	$25.02
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	10	$287.10
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$12.66	0.5	$6.33
Tree, Hardwood, Potted, Medium	1532	Potted hardwood seedling, 2 gallons or larger. Includes materials and shipping only.	Each	$14.28	20	$285.60
Tree shelter, solid tube type, 4 in. x 60 in.	1567	4 inch x 60 inch tree tube for protection from animal damage. Materials and shipping only.	Each	$6.67	20	$133.40
Cable ties, plastic	1575	Plastic cable ties (typ. 8-12 in.) to assist in securing items. Materials only.	Each	$0.07	60	$4.20
Stakes, wood, 3/4 in. x 3/4 in. x 60 in.	1583	3/4 in. x 3/4 in. x 60 in. wood stakes to fasten items in place. Includes materials only.	Each	$2.43	20	$48.60

Practice: E612G - Tree/shrub planting for wildlife food

Scenario: #1 - Tree/shrub planting for wildlife food

Scenario Description:
Tree or shrub planting to enhance habitat for native wildlife. A minimum of five tree or shrub species will be used; they will be species that provide food and/or cover for identified wildlife species.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 612 - Tree/Shrub Establishment

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 612 - Tree/Shrub Establishment

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $2,215.95

Scenario Cost/Unit: $2,215.95

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	2	$50.72
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acres	$6.73	1	$6.73
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$12.51	11	$137.61
Foregone Income						
FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acres	$415.54	0.41	$170.37
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acres	$342.50	0.36	$123.30
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acres	$272.50	0.23	$62.68
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	11	$315.81
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$12.66	1	$12.66
Herbicide, Sulfometuron & metsulfuron	344	A residual sulfonylurea herbicide that kills broadleaf weeds and some annual grasses. It is a systemic compound with foliar and soil activity. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$11.34	1	$11.34
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.61	1	$1.61
Shrub, Seedling, Medium	1507	Bare root shrub seedling, 18 to 36 inches tall; includes tropical containerized seedlings 10 to 20 cubic inches. Includes materials and shipping only.	Each	$1.56	605	$943.80
Tree, Hardwood, Seedling, Medium	1510	Bare root hardwood seedlings 18 to 36 inches tall; includes tropical containerized seedlings of 10 to 20 cubic inches. Includes materials and shipping only.	Each	$1.74	218	$379.32

Practice: E643A - Restoration of sensitive coastal vegetative communities

Scenario: #1 - Restoration of sensitive coastal vegetative communities

Scenario Description:
Enhance the level of restoration in unique and diminishing coastal ecosystems by establishing native herbaceous and woody plants. Protect established vegetation, and manage to maintain floristic quality and the provision of environmental services. This enhancement is applied on unique areas with rare and declining habitat conditions, where vegetation has been detrimentally altered by human or natural events. Targeted sites are those that formerly supported vegetative communities that are now declining and/or becoming rare. The sites will vary across the continent. The enhancement will expand and elevate the process of restoring these unique areas, increasing their ecological value and benefits to wildlife. It re-establishes a select group of trees and/or shrubs that are key components in this ecosystem.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 643 - Restoration and Management of Rare and Declining Habitats

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 643 - Restoration and Management of Rare and Declining Habitats

Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 25.00

Scenario Total Cost: $3,812.92

Scenario Cost/Unit: $152.52

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$56.88	8	$455.04
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$12.51	8	$100.08
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	8	$242.88
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	2	$97.20
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	7	$780.15
Materials						
Post, Steel T, 1.33 lbs, 6 ft.	15	Steel Post, Studded 6 ft. - 1.33 lb. Includes materials and shipping only.	Each	$7.23	50	$361.50
Tree Marking Paint	313	Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only.	Acres	$12.39	5	$61.95
Cattle Panel	1409	Welded wire cattle panel typically 1/4 inch galvanized steel rods, 50 in. high x 16 ft. long. Materials only.	Each	$32.94	25	$823.50
Tree, Hardwood, Potted, Medium	1532	Potted hardwood seedling, 2 gallons or larger. Includes materials and shipping only.	Each	$14.28	25	$357.00
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: E643B - Restoration and management of rare or declining habitat

Scenario: #1 - Restoration and management of rare or declining habitat

Scenario Description:
Provide protection from adverse environmental conditions to create refugia for documented occurrences of sensitive plant communities.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 643 - Restoration and Management of Rare and Declining Habitats

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 643 - Restoration and Management of Rare and Declining Habitats

Feature Measure: Feet of Fence

Scenario Unit: Feet

Scenario Typical Size: 440.00

Scenario Total Cost: $4,579.45

Scenario Cost/Unit: $10.41

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hours	$9.89	8	$79.12
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	2	$12.60
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	8	$202.88
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hours	$36.34	8	$290.72
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	16	$459.36
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	2	$222.90
Materials						
Wire, Woven, Galvanized, 12.5 Gauge, 48 inch	4	Galvanized 12.5 gauge, 48 in. - 330' roll. Includes materials and shipping only.	Each	$334.44	3	$1,003.32
Post, Wood, CCA treated, 6 in. x 12-14 ft.	13	Wood Post, Line/End 6 inch dia. X 12-14 ft., CCA Treated. Includes materials and shipping only.	Each	$38.98	38	$1,481.24
Fence, Wire Assembly, Woven Wire	35	Brace pins, twist sticks, staples. Includes materials and shipping only.	Feet	$0.15	1648	$247.20
Gate, Game, 8 ft. High X 4 ft. Wide	1082	4 Foot wide game gate (8 feet tall). Includes materials and shipping only.	Each	$276.17	1	$276.17
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: E643C - Restore glade habitat to benefit threatened and endangered species and state species of concern

Scenario: #5 - Restore glade habitat to benefit threatened and endangered species and state species of concern

Scenario Description:

Restore Glade natural communities as shown by the Ecological Site Description to conserve biodiversity. Enhancement requires reducing woody canopy cover and applying at least one prescribed fire to treated acres. Restoration of glade communities provide habitat for rare and declining species. Sites that previously or currently support the rare and declining habitat will be targeted for restoration.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard 643 - Restoration of Rare or Declining Habitat.

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard 643 - Restoration of Rare or Declining Habitat.

Feature Measure: Acres

Scenario Unit: Acres

Scenario Typical Size: 5.00

Scenario Total Cost: $7,676.17

Scenario Cost/Unit: $1,535.23

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hours	$56.88	2	$113.76
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	80	$504.00
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	2.5	$63.40
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$81.82	1.5	$122.73
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	22	$398.86
Water tank, portable	1602	Portable water tank transported in a pick up truck. Typically with 200 gallon capacity includes tank with pump, hose and sprayer. Does not include the pickup truck. Equipment only.	Hours	$12.84	2	$25.68
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	116	$5,088.92
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	4	$194.40
Materials						
Herbicide, Triclopyor	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acres	$34.16	0.5	$17.08
Fuel, ignition fuel mixture	1596	Mixture of gasoline and diesel for ignition of prescribed burns. Materials only.	Gallons	$3.71	5	$18.55
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	2	$364.16
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	1	$764.63

Practice: E643D - Low-tech process-based restoration to enhance floodplain connectivity

Scenario: #11 - Low-tech process-based restoration to enhance floodplain connectivity

Scenario Description:

This enhancement is intended to kick-start natural ecological, geomorphic and hydrologic processes required for improvement and maintenance of healthy and functioning streams and associated floodplains in situations where planning criteria has already been met but restoration or enhancement is desired to improve floodplain connectivity, riparian condition and move towards Stage 0 stream conditions. Beaver Dam Analogues (BDAs) and/or Post-Assisted Log Structures (PALS) are low-tech structures used to facilitate process-based restoration of rare and declining 'Stage 0' stream conditions by mimicking, promoting, and sustaining the natural processes of beaver dam activity and wood accumulation that lead to more fully connected floodplains. BDAs and PALS are hand-built with a mixture of woody debris and on-site soils and vegetation.

Before Situation:

State approved evaluation tool identifies that stream reaches meet planning criteria.

After Situation:

Wetted area associated with stream reach has expanded due to increase in floodplain connectivity, improvement of riparian condition and movement towards State 0 stream conditions

Feature Measure: Linear feet

Scenario Unit: Linear Feet

Scenario Typical Size: 400.00

Scenario Total Cost: $18,038.76

Scenario Cost/Unit: $45.10

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	24	$151.20
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	12	$304.32
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	18	$326.34
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hours	$12.51	48	$600.48
Portable Post Driver	2722	Gas or Hydraulic Powered Post Driver, Portable, <300 lbs, labor not included	Hours	$17.49	48	$839.52
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	60	$2,632.20
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	120	$3,445.20
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hours	$48.60	60	$2,916.00
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	30	$3,343.50
Materials						
Post, Wood, Untreated, 3-4 in. x 7 ft.	2721	Round Post, Wood, Untreated, 3-4 inch diameter x 7 feet	Each	$8.70	400	$3,480.00

Practice: E644A - Managing Flood-Irrigated Landscapes for Wildlife

Scenario: #1 - Managing Flood-Irrigated Landscapes for Wildlife

Scenario Description:
Developing and implementing a conservation plan that supports maintenance of flood-irrigation in key landscapes to provide important foraging habitat for local breeding and migratory waterfowl and waterbirds.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 644 ??? Wetland Wildlife Habitat Management

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 644 ??? Wetland Wildlife Habitat Management

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 50.00

Scenario Total Cost: $1,417.11

Scenario Cost/Unit: $28.34

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	9	$228.24
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	22	$631.62
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	5	$557.25

Practice: E645A - Reduction of attractants to human-subsidized predators in sensitive wildlife species habitat

Scenario: #1 - Reduction of attractants to human-subsidized predators in sensitive wildlife species habitat

Scenario Description:

Reduction of artificial perching sites, nest sites, food, and water available to subsidized predators in areas where human-subsidized predators are a threat to sensitive wildlife species. Human-subsidized predators may include ravens, crows, magpies, coyotes, foxes, skunks, raccoons, and other species. Activities under this enhancement may include removal of non- native or invasive trees; removal of unused power poles, corrals, windmills, buildings, and other vertical structures; and/or removal or management of watering facilities, dead livestock, road kill, garbage, animal feed, dumps, and other non-natural food sources.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 645 - Upland Wildlife Habitat Management

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 645 - Upland Wildlife Habitat Management

Feature Measure: Acre

Scenario Unit: Number

Scenario Typical Size: 40.00

Scenario Total Cost: $2,336.16

Scenario Cost/Unit: $58.40

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	24	$608.64
Trailer, enclosed, small	1503	Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included.	Hours	$14.56	24	$349.44
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	48	$1,378.08

Practice: E645B - Manage existing shrub thickets to provide adequate shelter for wildlife

Scenario: #5 - Manage existing shrub thickets to provide adequate shelter for wildlife

Scenario Description:
Existing shrub thickets provide an instant and important cover for wildlife. Various wildlife species may use shrubs as winter/thermal cover, summer shade, roosting, or as escape cover from predators. Proper management ensures that these shrubs will continue to provide the desired benefits for the local wildlife. A combination of herbicide treatments, cutting and trimming branches, and removal of other competing vegetation will occur. An eligible existing shrub thicket needs to have a canopy cover of 750 square feet, with an end goal of expanding to 1500 square feet. Any existing shrub thicket (not hand planted within the last 5 years) are eligible for this enhancement. Shrub thickets found within fence rows may now be very wide, but still meet the 750 square feet, are eligible.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard 645 - Upland Wildlife Habitat Management

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard 645 - Upland Wildlife Habitat Management

Feature Measure: Acres

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $446.38

Scenario Cost/Unit: $446.38

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	2	$12.60
Pruning tools, hand tools	1318	Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included.	Hours	$2.31	2	$4.62
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	2	$87.74
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	4	$114.84
Materials						
Herbicide, Imazapyr	336	Pre and post-emergent, non-selective herbicide for control of undesirable vegetation in non-crop areas. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$42.89	1	$42.89
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.61	1	$1.61
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08

Practice: E645C - Edge feathering for wildlife cover

Scenario: #5 - Edge feathering for wildlife cover

Scenario Description:
Selected trees are cut and brush clipped along the border between a wooded area and a grassland, cropland, or idle land, creating a dense woody cover of interlocking branches at ground level. The feathered edge will be an average of 30 feet wide and a minimum of 50 feet long, resulting in an area of 1500 square feet. The width of the strip will vary to follow topographic features and to create a wavy border; the design will also consider aesthetics. Vegetative composition and cover will vary within the edge, ranging from areas with no trees and shrubs to areas with scattered trees and extensive shrub cover. The variation in vegetation structure along with variable width of the edge will create feathering. The edge may include shrub plantings for wildlife food and aesthetics.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard 645 - Upland Wildlife Habitat Management

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard 645 - Upland Wildlife Habitat Management

Feature Measure: Acres

Scenario Unit: Acres

Scenario Typical Size: 1.00

Scenario Total Cost: $1,068.34

Scenario Cost/Unit: $1,068.34

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	8	$50.40
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$81.82	2	$163.64
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	8	$350.96
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	2	$57.42
Materials						
Herbicide, Triclopyor	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acres	$34.16	1	$34.16
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$182.08	1	$182.08

Practice: E645D - Wildlife Habitat Management Plan for Upland Landscapes

Scenario: #12 - Wildlife Habitat Management Plan for Upland Landscapes

Scenario Description:

Develop and implement a wildlife habitat management plan that removes or significantly reduces the impact of existing land management activities occurring within agricultural landscapes (on any land use) causing chronic disturbance to wildlife during breeding, rearing, migration and over- wintering periods. Site monitoring may be necessary to identify and document sources of disturbance to wildlife. Examples of adjustments to existing management activities that can reduce disturbance to a tolerable level include: use of integrated pest management; capping of open vertical pipes; provision of wildlife-friendly water access and egress; and reduction of noise or movement within key migratory, nesting, rearing, loafing or hiding locations.

Before Situation:

The inadequate terrestrial wildlife habitat concern has been addressed under Conservation Practice Standard 645 and minimum planning criteria for the terrestrial wildlife habitat resource concern has been met. However, disturbance related impacts tied to the agricultural operation are negatively impacting wildlife.

After Situation:

Land management activities occurring within the agricultural landscape (on any land use) have been adjusted to avoid causing chronic disturbance to wildlife during breeding, rearing, migration and over- wintering periods has been addressed. Planning criteria for the terrestrial wildlife habitat resource concern exceeds minimum planning criteria.

Feature Measure: Acres of Improved Habitat

Scenario Unit: Acres

Scenario Typical Size: 40.00

Scenario Total Cost: $412.68

Scenario Cost/Unit: $10.32

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	3	$76.08
Rangeland/grassland field monitoring kit	967	Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only.	Each	$49.50	1	$49.50
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	10	$287.10

Practice: E646A - Close structures to capture and retain rainfall for waterfowl and wading bird winter habitat

Scenario: #1 - Close structures to capture and retain rainfall for waterfowl and wading bird winter habitat

Scenario Description:
When flooded to shallow depths during fall and winter, agricultural fields provide ideal foraging habitat for myriad species of waterfowl and wading birds . In addition, flooded conditions promote establishment of aquatic invertebrate populations, thus providing protein-rich food sources for shorebirds as well as waterfowl and wading birds.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 646 - Shallow Water Development and Management

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 646 - Shallow Water Development and Management

Feature Measure: acre

Scenario Unit: Acres

Scenario Typical Size: 50.00

Scenario Total Cost: $1,496.11

Scenario Cost/Unit: $29.92

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	9	$228.24
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hours	$31.60	2.5	$79.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	22	$631.62
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	5	$557.25

Practice: E646B - Extend retention of captured rainfall for migratory waterfowl and wading bird late winter habitat

Scenario: #1 - Extend retention of captured rainfall for migratory waterfowl and wading bird late winter habitat

Scenario Description:
When flooded to shallow depths during fall and winter, agricultural fields provide ideal foraging habitat for myriad species of waterfowl and wading birds. Harvested and idled agricultural lands, notably those occurring within rice rotations, contain high densities of residual (i.e., waste) grain and natural seeds following harvest. In addition, flooded conditions promote establishment of aquatic invertebrate populations, thus providing protein-rich food sources for shorebirds as well as waterfowl and wading birds. Benefits may become greatest during late winter and early spring as birds are assimilating nutrient and fat reserves in preparation for northward migration. However, agricultural fields flooded during fall-winter are typically drained during late January or February in advance of spring planting. This often results in a rapid reduction in available habitat, and may constrain ability of migratory birds to adequately prepare for migration, with greatest impacts likely occurring during years of low winter precipitation. Retention of water on agricultural lands into early spring will produce maximum benefits to migratory waterfowl and shorebirds by providing high quality habitat during a time when habitat may otherwise be in low abundance.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 646 - Shallow Water Development and Management

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 646 - Shallow Water Development and Management

Feature Measure: acre

Scenario Unit: Acres

Scenario Typical Size: 50.00

Scenario Total Cost: $1,773.12

Scenario Cost/Unit: $35.46

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	11	$278.96
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hours	$31.60	2.5	$79.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	26	$746.46
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	6	$668.70

Practice: E646C - Manipulate vegetation and maintain closed structures for shorebirds mid-summer habitat

Scenario: #1 - Manipulate vegetation and maintain closed structures for shorebirds mid-summer habitat

Scenario Description:
Suitable shorebird habitat is limited during the summer and fall as birds migrate south post-breeding and providing shallow water and mud flat habitat will benefit a variety of shorebird species. Optimal conditions are created when water levels are slowly reduced through evaporation, which allows for propagation of invertebrates (typically insect larvae) used as food by shorebirds. Manipulation of vegetation, preferably through rolling, creates open conditions required by this suite of birds as a means to detect and avoid predators, and provides nutrient inputs for invertebrate production.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 646 - Shallow Water Development and Management

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 646 - Shallow Water Development and Management

Feature Measure: acre

Scenario Unit: Acres

Scenario Typical Size: 50.00

Scenario Total Cost: $3,297.69

Scenario Cost/Unit: $65.95

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	9	$228.24
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hours	$31.60	4.5	$142.20
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acres	$22.61	50	$1,130.50
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	22	$631.62
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	5	$557.25
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	2	$607.88

Practice: E646D - Manipulate vegetation and maintain closed structures for shorebird late summer habitat

Scenario: #1 - Manipulate vegetation and maintain closed structures for shorebird late summer habitat

Scenario Description:
Suitable shorebird habitat is limited during the summer and fall as birds migrate south post-breeding. Providing shallow water and mud flat habitat will benefit a variety of shorebird species. Optimal conditions are created when water levels are slowly reduced through evaporation, which allows for propagation of invertebrates (typically insect larvae) used as food by shorebirds. Manipulation of vegetation, preferably through rolling, creates open conditions required by this suite of birds as a means to detect and avoid predators, and provides nutrient inputs for invertebrate production.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 646 - Shallow Water Development and Management

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 646 - Shallow Water Development and Management

Feature Measure: acre

Scenario Unit: Acres

Scenario Typical Size: 50.00

Scenario Total Cost: $3,606.30

Scenario Cost/Unit: $72.13

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	11	$278.96
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hours	$31.60	5.5	$173.80
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acres	$22.61	50	$1,130.50
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	26	$746.46
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	6	$668.70
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	2	$607.88

Practice: E647A - Manipulate vegetation on fields with captured rainfall for waterfowl & wading bird winter habitat

Scenario: #1 - Manipulate vegetation on fields with captured rainfall for waterfowl & wading bird winter habitat

Scenario Description:

Harvested and idled agricultural lands, notably those occurring within rice rotations, contain high densities of residual (i.e., waste) grain and natural seeds following harvest. Seed densities in harvested rice fields may rival those documented in intensively managed moist-soil units, especially in the Gulf Coast and Central Valley of California. When flooded to shallow depths during fall and winter, these agricultural fields provide ideal foraging habitat for myriad species of waterfowl and wading birds. In addition, flooded conditions promote establishment of aquatic invertebrate populations, thus providing protein-rich food sources for shorebirds as well as waterfowl and wading birds. In many cases, light manipulation of dense vegetation is needed to improve the accessibility of food resources to waterfowl, wading birds, and shorebirds.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 647 - Early Successional Habitat Development and Management

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 647 - Early Successional Habitat Development and Management

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 50.00

Scenario Total Cost: $2,373.10

Scenario Cost/Unit: $47.46

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$75.12	8	$600.96
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	8	$242.88
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: E647B - Provide early successional shorebird habitat between first crop and ratoon crop

Scenario: #1 - Provide early successional shorebird habitat between first crop and ratoon crop

Scenario Description:

Many declining suites of wildlife species rely on early successional habitats for at least part of their life cycle needs. Migratory shorebird species in particular rely on open, moist soil or shallowly flooded conditions for foraging and security. Rice farms support many migratory and resident water bird species. The first rice crop harvest often coincides with the arrival of early migrating shorebirds. This time of year is also the highest rainfall months. If standing rice stubble from the first crop is rolled to push above-ground stalks level with the soil surface, the first component of this type of habitat is met. When moisture is added to this situation, short-term habitat is available until the ratoon crop initiates growth to a height beyond that which would provide benefit to the early successional species.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 647 - Early Successional Habitat Development and Management

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 647 - Early Successional Habitat Development and Management

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 50.00

Scenario Total Cost: $2,373.10

Scenario Cost/Unit: $47.46

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hours	$75.12	8	$600.96
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	8	$242.88
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$764.63	2	$1,529.26

Practice: E647C - Maintain most soil vegetation on cropland edges to enhance waterfowl and shorebird habitat

Scenario: #1 - Maintain most soil vegetation on cropland edges to enhance waterfowl and shorebird habitat

Scenario Description:
The wetter or more water saturated portions of cropland fields such as areas adjacent to field drains, have the potential to produce a significant amount of moist soil plants which are a tremendously valuable source of forage and cover for many waterfowl, shorebird and wading bird species, especially during a period of time when such plants may be limited. Under normal cropland production, the native vegetation is restricted on these sites through mechanical and/or chemical control. These maintained moist soil plants also will provide filtering and improve water quality.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 647 - Early Successional Habitat Development and Management

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 647 - Early Successional Habitat Development and Management

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 50.00

Scenario Total Cost: $793.76

Scenario Cost/Unit: $15.88

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hours	$31.60	3	$94.80
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	3	$91.08
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	2	$607.88

Practice: E647D - Establish and maintain early successional habitat in ditches and bank borders

Scenario: #1 - Establish and maintain early successional habitat in ditches and bank borders

Scenario Description:

This enhancement is to encourage the establishment of early successional, naturally occurring vegetation in ditches, side slope and bank borders to provide cover, critical nesting and brood rearing habitat as well as filtering overland flow and improving water quality. Ditches perform the critical function of removing water from agricultural lands. Allowing naturally occurring vegetation to develop along ditches, including side slopes, banks and borders, will help provide food and cover for wildlife while enhancing aquatic habitat and improving water quality. Ditches and ditch borders provide a foundation that supports a diverse wildlife community including Northern Bobwhite (Colinus virginianus) and other birds preferring early successional cover. Rabbits, furbearers, amphibians and many other species that inhabit agriculture areas will use this vegetative cover. These areas can also provide critical nesting habitat for the Mottled Duck (Anas fulvigula).

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 647 - Early Successional Habitat Development and Management

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 647 - Early Successional Habitat Development and Management

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 50.00

Scenario Total Cost: $793.76

Scenario Cost/Unit: $15.88

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hours	$31.60	3	$94.80
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	3	$91.08
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	2	$607.88

Practice: E666A - Maintaining and improving forest soil quality

Scenario: #1 - Maintaining and improving forest soil quality

Scenario Description:
Adopts guidelines for maintaining and improving soil quality on sites where forest management activities are practiced. These guidelines will increase soil organic matter content, improve nutrient cycling, and increase infiltration and retention of precipitation. Avoiding soil compaction will allow for greater root development and tree growth, limit windthrow, and reduce drought stress. Increasing carbon storage on site will maintain the soil microbial community and provide wildlife benefits.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 50.00

Scenario Total Cost: $2,259.00

Scenario Cost/Unit: $45.18

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	4	$25.20
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	2	$50.72
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	4	$72.52
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	13	$1,448.85
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$14.19	10	$141.90
Tree Marking Paint	313	Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only.	Acres	$12.39	5	$61.95
Certified Organic, Annual Grasses, Legumes and/or Forbs	2343	Annual grasses, mostly introduced but may be native. Used for temporary cover or cover crops. Certified organic. Includes material and shipping only.	Acres	$76.06	3	$228.18

Practice: E666D - Forest management to enhance understory vegetation

Scenario: #1 - Forest management to enhance understory vegetation

Scenario Description:

This enhancement provides for management of the understory vegetation in a forested area by mechanical, chemical, and/or manual methods to improve the plant species mix and the health of the residual vegetation. Managing the understory vegetation increases available water to the plants, minimizes runoff and erosion, and improves water quality. An adequately stocked forest provides inputs of leaves, needles, and woody twigs and stems to the forest floor, adding to soil organic matter and contributing to forest soil health. Desirable tree species and understory vegetation, with spacing that allows ground cover to develop, will allow moisture to infiltrate and be stored in the soil, releasing moisture over longer periods of time.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 20.00

Scenario Total Cost: $6,052.81

Scenario Cost/Unit: $302.64

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Mechanical cutter, chopper	943	Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included.	Hours	$116.89	16	$1,870.24
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$81.82	16	$1,309.12
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	16	$485.76
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	11	$1,225.95
Materials						
Herbicide, Imazapyr	336	Pre and post-emergent, non-selective herbicide for control of undesirable vegetation in non-crop areas. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$42.89	20	$857.80
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: E666E - Reduce height of the forest understory to limit wildfire risk

Scenario: #1 - Reduce height of the forest understory to limit wildfire risk

Scenario Description:

Forest stand improvement that manages forest structure to reduce the risk of wildfire, and creates conditions that facilitate prescribed burning. The fire risk reduction is accomplished by reducing the height of the woody understory and midstory, creating space between the ground cover and the tree canopy. This enhancement provides for management of the understory vegetation in a forested area, using mechanical, chemical or manual methods to improve the plant species mix and the health of the residual vegetation, and reduce the risk of wildfire. In appropriate stands, the treatment creates conditions that favor prescribed burning. Forest stand improvement (FSI) activities are used to remove trees of undesirable species, form, quality, condition, or growth rate. The quantity and quality of forest for wildlife and/or timber production will be increased by manipulating stand density and structure. These treatments can also reduce wildfire hazards, improve forest health, restore natural plant communities, and achieve or maintain a desired native understory plant community for soil health, wildlife, grazing, and/or browsing.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 20.00

Scenario Total Cost: $6,052.81

Scenario Cost/Unit: $302.64

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Mechanical cutter, chopper	943	Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included.	Hours	$116.89	16	$1,870.24
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$81.82	16	$1,309.12
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	16	$485.76
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	11	$1,225.95
Materials						
Herbicide, Imazapyr	336	Pre and post-emergent, non-selective herbicide for control of undesirable vegetation in non-crop areas. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$42.89	20	$857.80
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: E666F - Reduce forest stand density to create open stand structure

Scenario: #1 - Reduce forest stand density to create open stand structure

Scenario Description:
Reducing forest stand density creates open forest conditions with a low basal area which promotes the health and vigor of the residual trees. The open stand structure allows a significant amount of sunlight to reach the forest floor and stimulates the growth of understory vegetation. Understory vegetation management, along with the wide spacing between trees or clumps of trees, provides visual appeal, lowers the risk of wildfire, and provides habitat for many at-risk and listed wildlife species. The enhancement creates conditions that facilitate a follow-up treatment with prescribed burning.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 20.00

Scenario Total Cost: $6,969.09

Scenario Cost/Unit: $348.45

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Mechanical cutter, chopper	943	Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included.	Hours	$116.89	20	$2,337.80
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$81.82	20	$1,636.40
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	20	$607.20
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	11	$1,225.95
Materials						
Herbicide, Imazapyr	336	Pre and post-emergent, non-selective herbicide for control of undesirable vegetation in non-crop areas. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$42.89	20	$857.80
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: E666G - Reduce forest density and manage understory along roads to limit wildfire risk and improve habitat

Scenario: #1 - Reduce forest density and manage understory along roads to limit wildfire risk and improve habitat

Scenario Description:

Opening the tree canopy along roads ('daylighting'), and providing space between ground vegetation and tree crowns minimizes the spread of wildfires that often start along roads, and improves wildlife habitat and food sources for many species. Some trees near a forest road are removed through harvesting, cutting, mulching, or another option available at the site, with the objective of creating a partially open forest canopy bordering the road. A semi-open canopy allows more sunlight to reach the forest floor to promote herbaceous understory plants, and reduces maintenance needs by allowing moisture to evaporate from roads. The reduced canopy and herbaceous understory limit woodland fuel buildup and reduce fire intensity.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 10.00

Scenario Total Cost: $3,433.14

Scenario Cost/Unit: $343.31

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	8	$50.40
Mechanical cutter, chopper	943	Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included.	Hours	$116.89	8	$935.12
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$81.82	8	$654.56
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	8	$229.68
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12 in., Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hours	$30.36	8	$242.88
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	8	$891.60
Materials						
Herbicide, Imazapyr	336	Pre and post-emergent, non-selective herbicide for control of undesirable vegetation in non-crop areas. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$42.89	10	$428.90

Practice: E666H - Increase on-site carbon storage

Scenario: #1 - Increase on-site carbon storage

Scenario Description:
Use forest management techniques to maintain and increase on-site carbon storage. These include, but are not limited to, applying uneven-aged management, using longer rotations, retaining cavity/den trees, snags, and down woody debris, and protecting or increasing soil organic material.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 40.00

Scenario Total Cost: $1,448.85

Scenario Cost/Unit: $36.22

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	13	$1,448.85

Practice: E666I - Crop tree management for mast production

Scenario: #1 - Crop tree management for mast production

Scenario Description:
Forest stand improvement using crop tree management techniques to increase mast production

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 10.00

Scenario Total Cost: $4,281.21

Scenario Cost/Unit: $428.12

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	25	$157.50
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	6	$152.16
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$81.82	25	$2,045.50
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	25	$717.75
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	8	$891.60
Materials						
Tree Marking Paint	313	Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only.	Acres	$12.39	10	$123.90
Herbicide, Picloram	337	Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$19.28	10	$192.80

Practice: E666J - Facilitating oak forest regeneration

Scenario: #1 - Facilitating oak forest regeneration

Scenario Description:
Facilitate oak regeneration following a forest stand improvement treatment for natural oak regeneration (i.e., a regeneration cut). After a regeneration cut, oaks in the seedling and sapling stages are often out-competed by invasive brush and undesirable tree and shrub species. This enhancement will release seedling and sapling oaks from competing invasive plants and other undesirable species, and thin stump sprouts. A forester will monitor site conditions, treat competition, protect seedlings, and recommend additional follow-up treatments as needed. The enhancement protects investments in oak regeneration by providing for follow-up activities that require the expertise of a professional forester.

Before Situation:
Naturally regenerated oak seedlings and/or saplings are threatened by competition from undesirable vegetation.

After Situation:
Oaks in the forest stand are free from competition and have adequate space and light to allow them to grow into the forest canopy.

Feature Measure: Acres

Scenario Unit: Acres

Scenario Typical Size: 25.00

Scenario Total Cost: $16,562.84

Scenario Cost/Unit: $662.51

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	6	$37.80
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	16	$405.76
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$81.82	10	$818.20
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	6	$263.22
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	56	$1,607.76
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	34	$3,789.30
Materials						
Tree Marking Paint	313	Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only.	Acres	$12.39	5	$61.95
Herbicide, Triclopyor	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acres	$34.16	5	$170.80
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.61	5	$8.05
Tree shelter, solid tube type, 4 in. x 48 in.	1566	4 inch x 48 inch tree tube for protection from animal damage. Materials and shipping only.	Each	$5.29	1250	$6,612.50
Cable ties, plastic	1575	Plastic cable ties (typ. 8-12 in.) to assist in securing items. Materials only.	Each	$0.07	2500	$175.00
Stakes, wood, 3/4 in. x 3/4 in. x 48 in.	1582	3/4 in. x 3/4 in. x 48 in. wood stakes to fasten items in place. Includes materials only.	Each	$2.09	1250	$2,612.50

Practice: E666K - Creating structural diversity with patch openings

Scenario: #1 - Creating structural diversity with patch openings

Scenario Description:

Forest stand improvement that creates patch openings. Size, shape, and arrangement of patches will be based on natural features, and emulate patches that would result from natural disturbance regimes of wind or fire, varying geographically and by forest type, and by tree species desired from natural regeneration. The treatment will create diversity in stand composition and structure, increase pest resistance, and enhance wildlife food availability. Openings may provide regeneration sites and restore natural plant communities, and achieve or maintain a desired understory plant community for wildlife habitat.

Before Situation:

Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

After Situation:

The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 15.00

Scenario Total Cost: $8,975.40

Scenario Cost/Unit: $598.36

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	150	$945.00
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	15	$380.40
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	150	$4,306.50
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	30	$3,343.50

Practice: E666L - Forest Stand Improvement to rehabilitate degraded hardwood stands

Scenario: #1 - Forest Stand Improvement to rehabilitate degraded hardwood stands

Scenario Description:
Hardwood forestland has been subject to poor logging practices ("high-grading") for decades. Without professional forestry assistance the best species and individual trees are removed, often before maturity ("diameter-limit cutting"), leaving the poorest species and individual trees to regenerate the stand. Reversing this process requires cutting or killing poor quality trees while retaining any desirable species that might still be present. A combination of 3 silvicultural methods are applied: crop tree release, group selection (all trees removed from an area 0.25 to 1.0 acre in size) and small clear-cuts (all trees removed from an area 1-3 acres in size).

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

Feature Measure: Acres treated

Scenario Unit: Acres

Scenario Typical Size: 10.00

Scenario Total Cost: $6,161.50

Scenario Cost/Unit: $616.15

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	16	$100.80
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	2	$50.72
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$81.82	40	$3,272.80
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hours	$18.13	16	$290.08
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	16	$459.36
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	8	$891.60
Materials						
Tree Marking Paint	313	Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only.	Acres	$12.39	10	$123.90
Herbicide, Triazine	1321	Broad spectrum herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$66.83	10	$668.30
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$303.94	1	$303.94

Practice: E666O - Snags, den trees, and coarse woody debris for wildlife habitat

Scenario: #1 - Snags, den trees, and coarse woody debris for wildlife habitat

Scenario Description:
Improve wildlife habitat through creation and retention of snags, den trees, forest stand structural diversity, and coarse woody debris on the forest floor, to provide cover/shelter for native wildlife species.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 10.00

Scenario Total Cost: $641.29

Scenario Cost/Unit: $64.13

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	7	$44.10
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	1	$25.36
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$81.82	3	$245.46
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	7	$307.09
Materials						
Herbicide, Picloram	337	Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$19.28	1	$19.28

Practice: E666P - Summer roosting habitat for native forest-dwelling bat species

Scenario: #1 - Summer roosting habitat for native forest-dwelling bat species

Scenario Description:
Create new potential roost trees within upland and riparian forests to achieve desired summer habitat for forest-dwelling bat species.

Before Situation:
Resources are protected at the minimum level of the Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

After Situation:
The adoption of this enhancement will provide resource protection above the minimum level as described in Conservation Practice Standard (CPS) 666 - Forest Stand Improvement

Feature Measure: Acre

Scenario Unit: Acres

Scenario Typical Size: 10.00

Scenario Total Cost: $2,433.45

Scenario Cost/Unit: $243.35

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	13	$81.90
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	6	$152.16
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$81.82	13	$1,063.66
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	13	$373.23
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	4	$445.80
Materials						
Tree Marking Paint	313	Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only.	Acres	$12.39	10	$123.90
Herbicide, Picloram	337	Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$19.28	10	$192.80

Practice: E666R - Forest songbird habitat preservation

Scenario: #1 - Forest songbird habitat preservation

Scenario Description:
Adopts guidelines and methods developed by the Forest Bird Initiative of the Vermont Audubon Society, to preserve habitat features following a forest stand improvement treatment designed to create habitat for a suite of forest-dwelling neotropical migratory songbirds. It includes developing or updating a forest management plan, inspecting and tending forest habitat, and monitoring bird populations. It protects investments in habitat creation by providing for follow-up activities that require the expertise of a professional forester or biologist. This enhancement is appropriate for states in the Atlantic Flyway and the Upper Midwest.

Before Situation:
The bird habitat of a forest stand is threatened by undesirable vegetation, including noxious and invasive plants, and tree regeneration of species not favorable to birds. Harmful insects and tree diseases may also be present, and storms may have damaged

After Situation:
The forest stand has retained its habitat features and is utilized by a diversity of neotropical migratory songbirds.

Feature Measure: Acres

Scenario Unit: Acres

Scenario Typical Size: 25.00

Scenario Total Cost: $5,299.36

Scenario Cost/Unit: $211.97

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	4	$25.20
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	10	$253.60
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$81.82	4	$327.28
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	4	$175.48
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	4	$114.84
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	38	$4,235.10
Materials						
Tree Marking Paint	313	Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only.	Acres	$12.39	2	$24.78
Herbicide, Triclopyor	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acres	$34.16	4	$136.64
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.61	4	$6.44

Practice: E666S - Facilitating longleaf pine establishment

Scenario: #7 - Facilitating longleaf pine regeneration and establishment

Scenario Description:

This enhancement facilitates longleaf pine regeneration and establishment following a forest stand improvement treatment for natural regeneration (e.g., a regeneration cut), or where longleaf has been previously planted. After a regeneration cut or a planting, competition from invasive brush and undesirable tree and shrub species often suppresses successful establishment of longleaf pine. This enhancement will release seedling and sapling longleaf from competing invasive plants and other undesirable species. A forester inspects the stand periodically for resource concerns that clients do not have the skills to recognize and assess, conducts regeneration surveys, and makes recommendations for corrective actions (typically at one year following initial treatment, and then at intervals of 2-4 years). Undesirable plants competing with longleaf pine are mechanically cut and/or receive herbicide spot treatments and/or cut stem treatments, as needed. The herbicides listed in the component section of this scenario are for deriving a cost estimate only. Resource concerns include Plant Productivity and Health, and Plant Structure and Composition.

Before Situation:

Naturally regenerated or planted longleaf pine seedlings and/or saplings are threatened by competition from undesirable vegetation.

After Situation:

Longleaf pines in the forest stand are free from competition and have adequate space and light to allow them to grow into the forest canopy.

Feature Measure: Acres

Scenario Unit: Acres

Scenario Typical Size: 25.00

Scenario Total Cost: $6,193.48

Scenario Cost/Unit: $247.74

Cost Details:

Component Name	ID	Description	Unit	Cost	QTY	Total
Equipment Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hours	$6.30	6	$37.80
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hours	$25.36	16	$405.76
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hours	$81.82	10	$818.20
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hours	$43.87	6	$263.22
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hours	$28.71	30	$861.30
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hours	$111.45	32	$3,566.40
Materials						
Tree Marking Paint	313	Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only.	Acres	$12.39	5	$61.95
Herbicide, Triclopyor	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acres	$34.16	5	$170.80
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acres	$1.61	5	$8.05