



## Design and Implementation Activity

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### Nutrient Management Design and Implementation Activity

#### DIA 157

##### Definition

Design the rate, source, placement, and timing of plant nutrients and soil amendments while reducing environmental impacts. Implementation requirements for Conservation Practice Standard (CPS) 590 Nutrient Management along with other supporting conservation practices are developed.

Nutrient management plans are documents of record, establishing how nutrients will be managed including the Rate, Source, Placement and Timing of plan nutrients for plant production while addressing identified resource concerns including the offsite movement of nutrients. These plans are prepared in collaboration with producer and/or landowner and designed to help the producer implement and maintain an effective plan for the application of nutrients from available sources.

##### Applicable Land Uses

Crop, Pasture, Associated Ag Land

#### REQUIREMENTS

##### General Requirements

A Design and Implementation Activity (DIA) assists a participant with implementing their conservation plan by providing site-specific instructions, requirements, plans, or specifications for putting conservation practices and enhancements on the land.

A DIA provides assistance for implementing a single conservation practice or a combination of structural, vegetative, or land management conservation practices, enhancements, and management activities.

Prior to initiation of the DIA 157, the Technical Service Provider (TSP) will schedule a conference with the participant and Natural Resources Conservation Service (NRCS) field office staff to ensure an understanding of the participant objectives (including practices to be covered by the DIA), required deliverables, and characteristics of the DIA tasks. The meeting between all parties may take place in person or electronically.

DIA assistance is based on the participant's conservation plan and applicable conservation practice standards and related technical guidance provided in the NRCS Field Office Technical Guide (FOTG). Each NRCS State Office publishes appropriate technical guidance and reference information in the state's version of the FOTG. DIA assistance must conform with the conservation practice standards included in FOTG, Section 4 for the state where the practice(s) are to be implemented. A TSP may use conservation practice supporting documents found in the applicable state's FOTG, Section 4 to facilitate delivery of appropriate information to the participant. Examples of conservation practice supporting documents include statements of work (SOW),

implementation requirements (IR), practice specifications (PS), standard drawings (SD), General Specifications (GS), Construction Specifications (CS), Material Specifications (MS), and design support tools. The FOTG homepage hyperlink is: <https://efotg.sc.egov.usda.gov/#>.

## Technical Requirements

DIA 157 documents the verification of the participant's conservation plan, and the development of the implementation requirements or plans and specifications for each planned conservation practice. The DIA 157 addresses site identified resource concerns, crops grown, crop rotation(s), times and types of tillage practices, and other supporting conservation practices that are implemented to improve or protect air, soil, and water resources. This activity only includes Conservation Practice 590 to address nutrient application and potential loss pathways for nitrogen and phosphorus.

DIA 157 must be developed by a Technical Service Provider (TSP) who meets NRCS Nutrient Management Plan certification requirements.

The activity will meet the NRCS planning criteria for the water quality resource concerns and any other of the following resource concerns components:

- 1) Nutrients transported to surface water
- 2) Nutrients transported to groundwater
- 3) Pathogens and chemicals from manure, biosolids or compost applications transported to surface water
- 4) Pathogens and chemicals from manure, biosolids or compost applications transported to groundwater
- 5) Plant health and productivity
- 6) Reduce emissions of objectionable odors, particulate matter (PM) and PM precursors, greenhouse gases (GHG), and ozone precursors
- 7) Soil organic matter depletion

Nutrient Management requirements: Nutrient Management DIA 157 must comply with all technical criteria contained in the State approved Nutrient Management (590) Conservation Practice Standard. The DIA must also address the use and management of all nutrients applied on agricultural lands from any available nutrient source (manure, wastewater, commercial fertilizers, crop residues, legume credits, irrigation water, organic by-products, etc.).

All nutrient rates, sources, placement, and timing are to be specific for the crop, field, and year over the crop rotation. The narrative method may be used for the precision rate calculations as it is impractical to describe actual rates for every unique grid cell/management unit.

### Soil and tissue testing and analysis

The nutrient management plan shall be based on current soil test results in accordance with land grant university (LGU) guidance, or industry practice when recognized by the LGU.

Note: Soil tests shall be no older than 2-years when developing new nutrient management

plans.

#### Manure, organic by-product, and biosolids testing and analysis

Manure, organic by-products, and biosolids shall be collected, prepared, stored, and shipped following LGU guidance or industry practice when recognized by the LGU.

Note: Should manure tests not be available yet, the use output and analyses from similar operations in the geographical area or “book values” recognized by the NRCS may be used if they accurately estimate nutrient output from the proposed operation or use.

#### Risk Assessments for Land Treatment on all fields where nutrients are applied:

Land treatment conservation practices planned for the fields where nutrients are applied can be found in the participants NRCS Conservation Plan. Resource assessments used to refine the nutrient management are included in the DIA 157 Nutrient Management plan. Nitrogen Leaching and Phosphorus Risk Assessments must be completed for each field. Wind and water soil erosion estimates from WEPS and RUSLE2 may be in the participant’s case folder. If no resource assessment documents are found, complete the assessment for each field.

- Nitrogen Leaching Risk Assessment:

Complete an NRCS-approved nutrient risk assessment for N on all fields where nutrient management is planned unless the State NRCS, in cooperation with State water quality control authorities, has determined specific conditions where N leaching is not a risk to water quality, including drinking water.

- Phosphorus Risk Assessment:

Complete an NRCS-approved nutrient risk assessment for Phosphorus when any of the following conditions are met—

- P application rate exceeds LGU fertility rate guidelines for the planned crop(s).
- The planned area is within a P-impaired watershed.
- The site-specific conditions equating to low risk of P loss have not been determined by the NRCS in cooperation with the State water quality control authority.

Note: Any fields excluded from a P risk assessment must have a documented agronomic need for P, based on soil test P and LGU nutrient recommendations.

- Erosion Risk Assessment:

Planners must use current NRCS nationally approved erosion-prediction technology to assess the risk of transporting nutrient from the field causing off-site degradation due to wind, water, and irrigation induced erosion.

### **The 4Rs of Nutrient Stewardship**

The DIA 157 Nutrient Management shall document the management techniques for nutrients based on the 4Rs of nutrient stewardship — *apply the right nutrient source at the right rate at the right time in the right place*—to improve nutrient use efficiency by the crop and to reduce nutrient losses to surface and groundwater and to the atmosphere.

- Nutrient source

Choose nutrient sources which are compatible with application timing, tillage and planting system, soil properties, crop, crop rotation, soil organic content, and local climate to minimize risk to the environment.

- Nutrient rate

Plan nutrient application rates for N, P, and K using LGU recommendations or industry practices when recognized by the LGU. Lower-than-recommended nutrient application rates are permissible if the participant's objectives are met. At a minimum, determine the rate based on crop/cropping sequence, current soil/manure test results, and NRCS-approved nutrient risk assessments. Where applicable, use realistic yield goals.

- Nutrient application timing and placement

Consider the nutrient source, management and production system limitations, soil properties, weather conditions, drainage system, soil biology, and nutrient risk assessment to develop optimal timing of nutrients. For N, time the application as closely as practical with plant and crop uptake. For P, time planned surface application when runoff potential is low. Time the application of all nutrients to minimize potential for soil compaction.

#### Additional Technical Requirements to Consider

- Plan/Apply conservation practices to avoid nutrient loss and control and trap nutrients before they can leave the field(s) by surface, leaching, or subsurface drainage (e.g., tile, karst) when there is a significant risk of transport of nutrients.
- When applicable, follow proper biosecurity measures as provided in NRCS directives GM-130, Part 403, Subpart H, "Biosecurity Preparedness and Response."
- To address air quality concerns caused by odor, N, sulfur, and particulate emissions; adjust the source, timing, amount, and placement of nutrients to reduce the negative impact of these emissions on the environment and human health.
- Design the plant or crop management systems so the soil conditioning index (SCI) organic matter subfactor is positive.

## **DELIVERABLES**

The TSP prepares all the following items to fulfill this DIA's requirements:

### **Cover Page**

The cover page must include the following:

- 1) DIA name and number.
- 2) Participant information: Name, address, email, phone, farm bill program name, contract number (TSP obtains contract number from participant), land identification (e.g., state, county, farm, and tract number).
- 3) TSP name, TSP number, TSP expiration date, mailing address, phone number, email address.
- 4) A statement by the TSP that services meet the DIA requirements, such as:

*I certify the work completed and delivered for the DIA 157:*

- *Complies with all applicable Federal, State, Tribal, and local laws, and regulations.*
- *Meets the General and Technical Requirements for the DIA 157.*
- *The planned practices are based on NRCS Conservation Practice Standards in the state Field Office Technical Guide where the practices are to be implemented.*
- *Is consistent with and meets the conservation goals and objectives for which the program contract was entered into by the participant.*
- *Incorporates alternatives that are both cost effective and appropriate to address the resource issue(s) and participant's objective(s).*

*TSP Signature* \_\_\_\_\_ *Date* \_\_\_\_\_

5) Participant's acceptance statement indicating:

*I accept the completed DIA deliverables as thorough and satisfying my objectives.*

*Participant Signature* \_\_\_\_\_ *Date* \_\_\_\_\_

6) A designated space for an NRCS reviewer to certify the agency's acceptance of the completed DIA.

*NRCS administrative review completion by:*

*Signature* \_\_\_\_\_ *Title* \_\_\_\_\_ *Date* \_\_\_\_\_

## **Notes and Correspondence**

1) Provide notes, in date-order that:

- a) Document each interaction with the participant, results of that interaction, and the date of the interaction.
- b) Document each site visit, its participants, the activity completed in the field, and results of each site visit.
- c) Provide initials of the note-maker, if more than one person provides the assistance.

2) Provide copies of correspondence between the TSP and the participant relating to decision-making and completion of the DIA 157. For example, description of alternatives presented for evaluation and decision-making.

## **Implementation Maps**

1) Maps developed for DIA 157 include, but are not limited to:

- a) Maps defined in the Nutrient Management Conservation Practice Standard.
- b) Field maps with Soil Survey Mapping Units.
- c) Map of location of designated sensitive areas and the associated nutrient application restrictions and setbacks.
- d) Map of location of nearby residences, or other locations where humans may be present on a regular basis, that may be impacted if odors or particulate matter are transported to those locations.

2) Maps for a DIA 157 must include these features:

- a) Map title.

- b) Participant's name.
- c) Assisted By [TSP planner's name].
- d) Name of applicable conservation district, county, and State.
- e) Date prepared.
- f) Map scale.
- g) Information needed to locate the planning area, such as geographic coordinates, public land survey coordinates, etc.
- h) North arrow.
- i) Appropriate map symbols and a map symbol legend on the map or as an attachment.

### **Design or Implementation Details**

- 1) Develop site-specific written instructions for implementing each planned conservation practice or activity included in the participant's DIA 157.
  - a) Include the completed state Conservation Practice Standard Implementation Requirements (IR), Standard Drawings (SD), Practice Specifications (PS), and Operation & Maintenance (OM) documents found in the State Field Office Technical Guide (FOTG), Section 4 or the equivalent.
  - b) Include, as a minimum, all items listed in Conservation Practice Standard 590 "Plans and Specifications" section.
  - c) Include all items listed in the "Operations and Maintenance" section.
- 2) Include all deliverables specified in the Conservation Practice Standard Statement of Work (SOW) documents in the state's FOTG Section 4.
- 3) Implementation Requirement documents in a state's FOTG Section 4 may be used to prepare and deliver site-specific conservation practice instructions but are not required to be used.

### **Supporting Documentation**

Provide results of design tools, resource assessments, or other analyses that are required to meet the Criteria and specifications in the state's Conservation Practice Standard and other conservation practice documents. Provide software datafiles used. The Nutrient Management DIA 157 must contain the following documentation in order to be deemed complete:

- 1) Results of approved risk assessment tools for N, P, and erosion losses.
- 2) Documentation establishing the application site presents a low risk for P transport to local water if P is applied in excess of crop requirement.
- 3) All available test results (e.g. soil, water, compost, manure, organic by-product, and plant tissue sample analyses) upon which the nutrient budget and management plan are based.

### **Deliver Completed Work**

The TSP must:

- 1) Prepare and provide two sets of the items listed in Deliverables to the participant.
  - a) One set is for the participant to keep.
  - b) The other set is for sharing with the local NRCS Office.

- c) The TSP may transmit a set of the Deliverables to the local NRCS Office, if their participant has authorized it. It is recommended to provide NRCS field office an opportunity to review the DIA deliverables, prior to asking for its acceptance.
- 2) Upload electronic copies of all the Deliverables on NRCS Registry.

## References

4R Nutrient Stewardship Certification Program Website.

<https://4rcertified.org/>

USDA Natural Resources Conservation Service. National Planning Procedures Handbook.

<https://directives.sc.egov.usda.gov/viewerFS.aspx?hid=44407>

USDA Natural Resources Conservation Service. Field Office Technical Guide.

<https://efotg.sc.egov.usda.gov/#/>

USDA Natural Resource Conservation Service National Agronomy Manual, Parts 507 and 503C. General Manual, Title 190, Part 402, Nutrient Management

USDA National Resource Conservation Service eDirectives, Nutrient Management Policy Implementation, National Instruction Title 190 Part 313

<https://directives.sc.egov.usda.gov/Default.aspx?l=176>

USDA Natural Resource Conservation Service USDA Natural Resources Conservation Service. National TSP Website.

<https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/technical/tsp/>

USDA Natural Resources Conservation Service. National TSP Resources.

<https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/programs/technical/tsp/?cid=nrcseprd1417414>

USDA Natural Resources Conservation Service. 590 Nutrient Management Practice Standard

[https://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/technical/cp/ncps/?cid=nrcs143\\_026849](https://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/technical/cp/ncps/?cid=nrcs143_026849)