# Drinking Water Protection Series
# *Nutrient Management Planning Basics*

## PURPOSE

Nutrient management traditionally has been concerned with optimizing the economic returns from nutrients to produce a good crop. More recently nutrient management planning has begun addressing ways to minimize the impact of nutrients on the environment. Development of these plans can help farmers reduce production risks by achieving optimal crop yields and product quality, managing input costs, avoiding over application of nutrients thus protecting our water resources, and sending a positive message to the community that farming enterprises are operating under rigorous standards.

Many Wellhead Protection Plans already include nutrient management planning as an objective however planners may have questions about what is included in a nutrient management plan and how this practice can be promoted in their protection area. This fact sheet will help you understand different types of nutrient management plans, components of the plan, and opportunities for their development.

## TYPES OF NUTRIENT MANAGEMENT PLANS

**Manure Management Plan-(MMP) –** A MMP describes how manure generated at a feedlot is going to be used during upcoming cropping year(s). Plans are developed in a way that protects surface and ground water quality while being beneficial from an agronomic and economic standpoint. Under Minnesota Pollution Control Agency Feedlot Rules, a MMP is required under the following circumstances:

- New construction permit applications;
- Feedlots with capacity of >1000 Animal Units (AU)[1];
- After January 1, 2006 feedlots holding 300 or more AU will be required to develop a MMP unless manure is applied by a commercial manure applicator;
- Some local county ordinances also require a MMP from feedlots with less than 300 AU.

**Nutrient Management Plan-(NMP)—** NMP's can be developed in a variety of different degrees of complexity. Farmers voluntarily adopt NMP as an approach to manage input costs and to maximize crop response. Cost share funding is available to producers that develop and implement a NMP under guidelines of the Environmental Quality Incentive Program (EQIP). Producers may qualify for $2.25 per acre for development and implementation of NMP using commercial fertilizer as a nutrient source or $4.00 per acre for plans that include manure. This program is administered through the USDA—Natural Resource Conservation Services (NRCS). For more information on EQIP and other source water protection funding sources go to: http://www.mda.state.mn.us/appd/watermatrix1.pdf

**Comprehensive Nutrient Management Plan-(CNMP)—**CNMP is a complex total planning tool that details animal production related activities, describes a farm's production practices, as well as the equipment and structures used. It combines conservation practices with management activities to create a system that addresses animal production, from feed inputs to the utilization of animal manure. These additional plan components are required for National Pollution Discharge Elimination System (NPDES) permits for feedlots with >1000 AU. CNMP are also required for USDA-NRCS cost-shared manure or waste storage structures.

## BASIC COMPONENTS OF A NUTRIENT MANAGEMENT PLAN

Management of crop nutrients is similar to balancing a check book. Annual nutrient uptake by crops is balanced against available nutrients in the soil, nutrients supplied from previous crops, and additional manure and fertilizer applications made by the farmer. The plan allocates the available nutrients in a way that maximizes their economic benefit while minimizing off site movement. Nutrient management plans include the following components:

- **Livestock facility and field maps**.
  - Information includes field and feedlot locations, fields with slopes >6%, and other sensitive features.
- **A current and planned crop rotation and expected yield goals.**

Photo courtesy of USDA-NRCS

[1] *AU=Animal Unit. Measurement of manure produced based on animal size. One AU=1000 equivalent animal pounds*

Photo courtesy of USDA-NRCS

- **Soil, plant, water, and manure sample results.**
- **An inventory of all nutrient sources.**
- **Planned nutrient applications.**
  This portion of the plan is where science, technology, and art meet. Application method, timing, and frequency must be included in this portion of the plan and follow established Best Management Practices (BMPs). Application rates (from all nutrient sources) must follow University of Minnesota recommendations.
- **Location of designated sensitive areas and associated nutrient management restrictions.**

*Example:* ***Manure Applications in Vulnerable Drinking Water Supply Management Areas***

- Maintain 50 ft. setback from wells when applying manure.
- Nitrogen rate limits pertain to all soils where manure is applied.
- Detailed manure applications records must be kept when feedlots with 100 animals or more apply manure in wellhead protection areas considered *vulnerable*.
- An interim permit is required if manure from facilities with 300 animal units or more apply regularly within a drinking water supply management area.

- **Operation and Maintenance Information**
  Information includes manure and soil sampling practices, manure spreader calibration and equipment maintenance information.
- **Record Keeping**
  - Feedlots with 100 AU or more located in a *vulnerable* drinking water supply management areas are required to keep manure application records for 6 years after manure has been applied. Farmers with feedlots located away from vulnerable aquifers must retain application records for 3 years.

## PLAN DEVELOPMENT

Nutrient management plans can be developed in many different ways. If plans are *required* by state feedlot rules or cost share reimbursement under USDA-NRCS programs, they must meet certain criteria and often times are reviewed. Certified Crop Advisers familiar with local farming practices can be a critical link for farmers with the planning process. For a listing of Certified Crop Advisers in your area go to: http://www.agronomy.org/cca Computer software available through the University of Minnesota Extension Service can also streamline the planning process. For more information on this software go to: http://wrc.coafes.umn.edu/EQIP/software.htm

Local public water suppliers have contracted with local Certified Crop Advisers to promote nutrient management planning and implementation. Other wellhead protection implementation ideas include cost share incentives for analytical soil and manure testing.

## CASE STUDY—Lincoln Pipestone Rural Water

Elevated nitrate levels in drinking water supply wells forced Lincoln Pipestone Rural Water Association to take immediate actions to protect their drinking water quality. A dedicated person was hired to develop nutrient management plans plus cost share incentives were provided for their development. Currently 28 farms have developed nutrient plans accounting for approximately 4130 acres of cropland within the drinking water supply management area. Nutrient management planning has proven to be a win-win for both farmers and Lincoln Pipestone Rural Water Association. Farmers are considering all nutrient sources, maximizing crop yields, and reducing production costs. Nitrate concentrations in public wells have stabilized as a result of implementing these nutrient management plans.

**Wellhead teams are encouraged to review the entire series of related fact sheets.**
http://www.mda.state.mn.us./appd/waterprotect.htm

## ADDITIONAL RESOURCES

- Minnesota Department of Agriculture –www.mda.state.mn.us/appd/ace/numgmt.htm
- University of Minnesota Extension—www.extension.umn.edu umn.edu/extens/manure/landapp/index.html
- Manure and Odor Education & Research—www.gaia.bae.umn.edu/extens/manure/landapp/index.htm
- Minnesota Pollution Control Agency—www.pca.state.mn.us/publications/wq-f8-07.pdf
- USDA-NRCS Minnesota Nutrient Web Site—www.mn.nrcs.usda.gov/ecs/nutrient.html
- Certified Crop Adviser Contacts-- http://www.agronomy.org/cca/search_cca.html
- Soil and Water Conservation Contacts— http://www.bwsr.state.mn.us/directories/SWCDs.pdf

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