MINNESOTA DEPARTMENT OF AGRICULTURE

Attachment 21

Priority Concerns Input
Chisago County Water Management Plan Update

Agency/Organization: Minnesota Department of Agriculture (MDA)

Submitted By: Robert Sip

Submission Deadline: April 26, 2012

Priority Concern 1: Agricultural Drainage, Wetlands and Water Retention

Why is it important the plan focus on this concern? It is recognized that adequate drainage is a critical component of a successful agricultural economy. High crop and land prices have the potential of increasing conversion of pasture and forage land to row crops, which in turn may lead to the installation of new drainage systems or drainage improvements to existing systems. New drainage and drainage improvements represent an opportunity to design and install systems in ways that help reduce nutrient losses into surface water and positively affect the timing and flows of drainage water into surface waters. These efforts combined with wetland restoration and water retention initiatives can have positive impacts upon water quality in agricultural landscapes.

What actions are needed for Agricultural Drainage? This plan should provide guidance, objectives, goals and action items for further coordination of agricultural water management issues and Conservation Drainage (CD) implementation efforts at the local level. A number of CD practices exist to address water quality issues. There is no single CD practice that will address all agricultural drainage issues. However, multi-purpose approaches to managing water quality and quantity on the agricultural landscape using a suite of CD initiatives is the best approach. It is recommended that:

- This water plan discuss how CD practices can be utilized based on the drainage needs of the county along with associated water management issues.
- Local drainage authorities be proactive in encouraging the use of CD practices and designs during repairs, maintenance and improvements of existing drainage systems. More specifically, this water plan should include discussion about the following:
    - Side inlet controls and prioritizing ditch systems for this practice and eliminating tile inlets.
    - Potential use of bioreactors and demonstration in the county.
    - The use of control structures on new pattern tile systems when appropriate.
    - Retrofitting older tile drainage systems to include control structures when appropriate.
    - Incorporating NRCS Drainage Water Management standards and CAP 130 plans.
- Redetermination of Benefits for ditch systems continue to be done in a proactive, consistent and systematic manner when deemed appropriate.
- Buffer initiatives continue to be implemented consistently and according to current drainage law.
- The local drainage authority continues to base local drainage regulations above and beyond Minnesota Statute 103E on science and current best management practice knowledge.
- The local drainage authority considers approaches outlined in the attached "Multipurpose Drainage" synopsis developed by BWSR.

As a point of interest, a technical and scientific committee is currently addressing the effect of tiling upon flooding in the Red River Valley. A weblink is provided to view two white papers on this subject from April 2011 and April 2012 (http://www.rrbdin.org/archives/649). This committee conducted an extensive literature review and developed a number of conclusions from the review in addition to a set of statements and recommendations. While this document and effort is specific to the Red River Valley, the county may find it useful to reference this report within the drainage discussion of the water plan update.

What actions are needed for Wetlands and Water Retention? Properly locating wetlands and water storage or retention projects can be a strategic component of overall efforts to manage nutrients, sediments and water quantity issues. The county may consider consulting with the Red River Watershed Management Board – Flood Damage Reduction Workgroup to determine how flood damage reduction, retention and mitigation efforts have progressed in Northwest Minnesota in conjunction with wetland restoration (via various state and federal programs). The Red River Valley has a long history of managing floodwater and constructing impoundments to manage floodwaters and significant insight could be gained by corresponding with this organization regarding water retention. A Technical and Scientific Advisory Committee as part of this Board has also developed a number of scientific papers on a variety of issues related to flood damage reduction. Specifically, the county should consider:

- Conducting/updating culvert inventories in conjunction with identifying where water retention projects can be constructed utilizing LIDAR and GIS technologies.
- Appropriate culvert sizing to reduce downstream impacts and water flows. Consider collaborative efforts with local road authorities on this item as well as the previous bullet.
- Identifying projects where tile water from public drainage systems can potentially be used to augment long-term water levels in wetland restorations for water retention purposes.
- Working with local farmers on agricultural wetland mitigation banking initiatives and include agricultural sectors on overall wetland planning efforts.
- Identify areas where constructed wetlands such as NRCS CP-39 wetlands can be located for treating tile drainage water.

What resources may be available to accomplish the actions for Agricultural Drainage, Wetlands and Water Retention? The county is referred to the following websites for more detailed information about drainage practices, wetlands and water retention:

- BWSR Drainage Website: http://www.bwsr.state.mn.us/drainage/index.html
- University of Minnesota Drainage Outlet: http://www.extension.umn.edu/DrainageOutlet/
- Controlled Drainage General Information: http://swroc.cfans.umn.edu/ResearchandOutreach/SoilManagement/WaterResearch/ControlledDrainage/index.htm
- Controlled Drainage for Agronomic and Environmental Benefits: http://swroc.cfans.umn.edu/prod/groups/cfans/@pub/@cfans/@swroc/documents/asset/cfans_asset_312126.pdf
- Constructed Basins for Agricultural Water Treatment in Minnesota: http://swroc.cfans.umn.edu/prod/groups/cfans/@pub/@cfans/@swroc/documents/asset/cfans_asset_279118.pdf
- General Red River Watershed Management Board Website: www.rrwmb.org
- Red River Watershed Management Board - Technical and Scientific Papers: http://www.rrwmb.org/html/info.cfm?ID=10#TSAC

What area(s) of the county is high priority? All agricultural lands of the county.

Priority Concern 2: Groundwater and Surface Water Protection: Agricultural Water Use/Land Management in Wellhead Protection Areas and Agricultural Chemicals/Nutrients

Why is it important the plan focus on this concern? Agricultural chemicals may contribute to water pollution from runoff into surface waters or infiltration into groundwater. Contaminated groundwater and surface water can affect human health as well as ecosystem quality.

The protection of drinking water is an important health issue as approximatley 75 percent of Minnesotans obtain their drinking water from groundwater. In areas with vulnerable groundwater, nitrates may exceed the drinking water standard. Once the standard is exceeded, it may be difficult to reduce the levels of contaminants. Therefore, it is highly desirable to prevent contamination of groundwater from occurring through protective actions in areas with vulnerable aquifers.

In areas with elevated nitrates in groundwater it is important to reduce their concentration. Similarily, pesticides may be present in shallow vulnerable groundwater. Agricultural chemicals are also frequently a concern related to surface water impairments under the clean water act. The most common agricultural sources of excess nutrients in surface water are chemical fertilizers and manure. Such nutrients contribute to eutrophication in surface water and have been identified as a source of hypoxia in the Gulf of Mexico.

What actions are needed?

- Continue the sealing of abandoned wells in agricultural landscapes and prioritize efforts for ISTS upgrades in sensitive areas. Utilize the MDA Ag BMP loan program and cost-share programs to assist landowners in addressing these issues.

- Crop Irrigation - Encourage the conversion of older irrigation systems to low pressure. Refer to the following MDA website on irrigation BMPs: http://www.mda.state.mn.us/protecting/conservation/practices/irrigation.aspx The MDA recommends that this water plan consider the following items specific to irrigation:

  - Develop and implement educational programs regarding water management in conjunction with nitrogen fertilizer management. Specifically the county may want to reference the following websites regarding coarse textured soils:

    Best Management Practices for Nitrogen on Coarse Textured Soils:
    http://www.extension.umn.edu/distribution/cropsystems/DC8556.pdf

    Best Management Practices for Nitrogen Use - Irrigated Potatoes
    http://www.extension.umn.edu/distribution/cropsystems/DC8559.pdf

  - Promote the establishment and data access of local climate stations to irrigators for ET (evapotranspiration) estimates.

  - Promote the use and availability of irrigation scheduling software and record keeping.

  - Promote the use of the county soil survey and other localized soils information in determining soil moisture holding capacity on a field-specific scale.

  - Encourage the use of soil moisture sensors (moisture blocks, tensiometers, etc.) and other advanced tools for determining crop water stress.

  - Fertigation (nitrogen applied through the irrigation water) is an excellent option for irrigators to distribute small amounts of nitrogen (20-30 lb/A). See the website above regarding coarse textured soils for details. Note that a fertigation permit and the proper backflow equipment is required by the MDA.

  - Provide assistance in irrigation uniformity testing and nozzle calibrations.

  - Provide nitrate testing services on irrigation water to help promote N crediting concepts and environmental protection. MDA staff can help provide equipment and technical assistance.

  - Promote hybrid and crop selection that have lower water and/or nitrogen requirements.

- Conduct training sessions and workshops for farmers that have agricultural production activities within wellhead protection areas and drinking water supply management areas. Encourage the use of the Nutrient BMP Challenge, Nutrient Management Initiative and similar tools within these areas. More resources regarding drinking water protection in agricultural settings can be found at - Drinking Water Protection: http://www.mda.state.mn.us/en/protecting/waterprotection/drinkingwater.aspx

What resources may be available to accomplish the actions? The MDA has prepared the attached map for the county to assist in local groundwater protection efforts. The map should be used to prioritize groundwater BMP implementation, protection and restoration efforts. The Water Table Aquifer Sensitivity map classifies the county into three aquifer sensitivity ratings: low, medium and high. These reflect the likelihood that infiltrating precipitation or surface water would reach the water table possibly bringing surface contaminants with it. Priority should be given to the Drinking Water Supply Management Areas (DWSAs), Wellhead Protection Areas and to the areas given a high aquifer sensitivity rating. Nitrate concentrations found in MDA monitoring wells and wells in the County Well Index (CWI) are also shown on the map. Concentrations greater than 3 mg/L indicate nitrate concentrations above background levels, while concentrations greater than 10 mg/L are above the nitrate drinking water standard. Additional websites:

EVALUATE

- Where can I find groundwater quality data? MDA groundwater monitoring reports: http://www.mda.state.mn.us/chemicals/pesticides/maace.aspx
- Where are the source water protection areas in my county? MDA interactive source water mapping tool: http://gis.mda.state.mn.us/source/
- Where is the geologic and hydrogeologic information for my county? County Geologic Map Program: http://www.dnr.state.mn.us/waters/groundwater_section/mapping/index.html
- What are producer adoption rates of voluntary Best Management Practices? Farm Nutrient Management Assessment Program (FANMAP): http://www.mda.state.mn.us/protecting/soilprotection/fanmap.aspx
- Where can I find producer nutrient management plot comparison results? Nutrient Management Initiative: http://www.mda.state.mn.us/protecting/soilprotection/nmi.aspx

PREVENT

- Agricultural Crops, Nutrients and Pesticides - Management Ideas for Wellhead Protection Programs: http://www.mda.state.mn.us/sitecore/content/Global/MDADocs/chemfert/reports/acnpideas.aspx
- Water Quality BMPs for Agricultural Herbicides: http://www.mda.state.mn.us/protecting/bmps/voluntarybmps.aspx
- Water Quality BMPs for Nitrogen Fertilizers: http://www.mda.state.mn.us/protecting/bmps/nitrogenbmps.aspx
- Nutrient Management Demonstration Plots: http://www.mda.state.mn.us/protecting/soilprotection/nmi.aspx
- Private Wells - Water Testing for Nitrate: http://www.mda.state.mn.us/protecting/waterprotection/nitrate.aspx
- Nutrient and Manure Management Planning: http://www.mn.nrcs.usda.gov/technical/ecs/nutrient/planning/planning.htm
- Nutrient and Manure Management Tables: http://www.mda.state.mn.us/en/chemicals/fertilizers/nutrient-mgmt.aspx
- Animal Mortalities: www.mda.state.mn.us/news/publications/animals/compostguide.pdf

What area(s) of the county is high priority? Rural or agricultural areas that are actively growing crops/producing livestock, coarse textured soils areas and wellhead protection areas that have agricultural activity.

Priority Concern 3: Manure Management and Livestock Issues

Why is it important the plan focus on this concern? Livestock manure used as fertilizer has benefited farmers for decades and if applied properly can meet crop nutrient requirements, build up soil organic material and decrease dependence on commercial fertilizers, increase soil fertility, and in some cases, reduce soil erosion. Manure as fertilizer is a constant reminder that we can reuse and recycle a product that was once thought of as a waste product with insignificant value. However, if manure is not properly applied it can lead to negative environmental impacts.

Manure, feed/silage leachate and milkhouse waste can be high in nutrient values, specifically pertaining to nitrogen and phosphorous. If improperly applied, manure does have the potential to contribute to nutrient loading and bacteria/viral levels of water sources. It is important for counties in the state to encourage the development of manure/nutrient management plans for the livestock producers within their borders. These plans address agronomic application rates for crops planted, buffered or protection areas around sensitive features, and reduce the potential of impacting surface or ground water.

Pasturing livestock is a common practice among livestock producers. Several studies and research through the University of Minnesota show that livestock grazing, if done properly, can enhance the quality of grazing lands. As your county is aware, pasture areas are often those areas that are not conducive to farming and generally contain sensitive landscape and surface water features. Nutrients left by livestock serve as a fertilizer source to pasture plant species, which then utilize and filter the nutrients rather than the nutrients being in excess and exiting the area in the form of runoff.

Types of vegetation, length of time in a pasture, stocking density and water availability are all issues livestock producers must be continued to be educated, in order to produce and utilize a productive, environmentally sound pasture or grazing system. Pastures or grazing systems not managed properly can restrict or eliminate vegetative growth and cover, which in turn can result in potentially negative water quality issues. Producers in watersheds that are impaired due to fecal coliform/E coli impairments need to be encouraged to be involved in TMDLs developed in the region. Local producer involvement on water plan advisory committees and water quality initiatives will provide additional insight into how producers can work with agencies to improve water quality.

What actions are needed?

- Continue and renew education and outreach efforts on manure/nutrient/pasture management planning and implementation. Work closely with local NRCS staff on this issue as well as regional MPCA staff.

- Encourage livestock producers to work with Technical Service Providers and/or Certified Crop Advisors to better utilize and understand the value of using GIS/GPS technologies in developing:

    - Manure management plans.
    - Comprehensive nutrient management plans.
    - Pasture management plans.
    - Rotational grazing plans.

- Encourage involvement from livestock producers located within impaired watersheds and vulnerable areas in the landscape. One such approach may be the development of a local agricultural advisory committee, and more information can be found at this website: http://www.mda.state.mn.us/~/media/Files/animals/startlvstkcomm.ashx

- Continue and/or make it a priority to provide technical and financial assistance for livestock producers to assist them with adopting best management practices to reduce impacts from manure runoff and manure storage structures or areas.

- Encourage livestock producers to participate in an on-farm environmental assessment program. A number of livestock producer groups in the state have specific programs that are available to their members. One such program is the Livestock Environmental Quality Assurance (LEQA) program that is available to all livestock producers in Minnesota. LEQA is an on-farm environmental assessment and results in a water quality score for a farm.

  As ecosystem services are better defined, producers that participate in an on-farm environmental assessment may be better situated to participate in future water quality or ecosystem services trading markets. More information about the LEQA program can be found at: www.agresourcestrategies.com or http://www.agresourcestrategies.com/LEQA.php

What resources may be available to accomplish the actions? The following websites can provide additional information about potential funding sources for producers:

- MDA Ag BMP Loan Program: http://www.mda.state.mn.us/en/grants/loans/agbmploan.aspx

- Sustainable Ag Loan Program: http://www.mda.state.mn.us/en/grants/loans/esaploan.aspx
- NRCS Cost Share Programs: http://www.mn.nrcs.usda.gov/
- BWSR Cost Share Funds: http://www.bwsr.state.mn.us/grants/apply/index.html
- MPCA 319 Grants: www.pca.state.mn.us/index.php/topics/feedlots/feedlot-nutrient-and-manure-management.html
- Minnesota Rural Finance Authority Loans: http://www.mda.state.mn.us/grants/loans/liveequip.aspx
- Livestock Environmental Quality Assurance Program (LEQA): www.agresourcestrategies.com or http://www.agresourcestrategies.com/LEQA.php

What area(s) of the county is high priority? Feedlots with open lots in shoreland or near sensitive water features and land where manure is applied in shoreland or near sensitive water features. Pasture areas located adjacent to shoreland areas.

Contacts/Resources:

- MDA Livestock Resources: www.mda.state.mn.us/animals/livestock.aspx
- University of Minnesota – Manure Management and Air Quality Education and Research: www.manure.umn.edu

---

Priority Concern 4: Agricultural Land Management

Why is it important the plan focus on this concern? The MDA recommends voluntary approaches to addressing soil loss and soil erosion issues and offers some suggestions as outlined below to engage agricultural producers in the county. Many advances have been made over the past decades to assist crop and livestock producers in managing their lands, including both from a technological and scientific standpoint. Advancements have also been made in recent years regarding seed technology, nutrient placement and timing of application, crop physiology research and overall land management, including improved soil and water management techniques. However, on certain soils, steep slopes, hydrologic settings or unique landscape features, there may be a need for additional voluntary measures to be implemented.

What actions are needed? The county water plan should consider including discussion about how to further encourage voluntary initiatives, such as the use of:

- Enhanced use of Precision Agricultural Technologies (PCT). While adoption of PCT has been widely adopted and accepted by many agricultural producers, there may be additional opportunities to further encourage the voluntary use of PCT in various agricultural settings of the county.
- Cover crops when appropriate. The use of cover crops may not be conducive to every crop rotation or landscape setting. However, certain cover crops can be beneficial for soil quality improvements, erosion control and soil fertility. More information about cover crops can be located at this website: http://www.mda.state.mn.us/protecting/sustainable/mfo/mfo-fruit-veg/covercrops.aspx
- Innovative residue management techniques that are crop rotation appropriate and designed to fit the needs of individual farming operations. More information about conservation tillage can be located at this website: http://www.mda.state.mn.us/protecting/conservation/practices/constillage.aspx
- Survey tools. The MDA developed a diagnostic tool a number of years ago called Farm Nutrient Management Assessment Process (FANMAP) to get a clear understanding of existing farm practices regarding agricultural inputs such as fertilizers, manures and pesticides. The use of FANMAP or other survey tools may be useful in certain areas of the county when working on a minor watershed basis. Contact the MDA for more specifics about how FANMAP can be used in your county or view this website: http://www.mda.state.mn.us/protecting/soilprotection/fanmap.aspx

- Enhanced promotion of buffer strips, filter strips, water and sediment and control basins and grassed waterways in areas with steep slopes, coarse soils and other high priority areas. The MDA realizes that resources are needed to accomplish promotional and educational initiatives to encourage the adoption of these types of practices. The county may want to partner with other local units of government in promoting higher levels of adoption for the above mentioned BMPs.

What area(s) of the county is high priority? All agricultural areas of the county. Specifically important for areas with steep slopes or coarse soils.

Priority Concern 5: Targeting of BMPs, Aligning Local Plans and Engaging Agriculture

Why is it important the plan focus on this concern? Technical, financial and staff resources are becoming more difficult to retain and obtain. As resources are scarce, the targeting of agricultural BMPs and conservation structures to the most vulnerable areas of the landscape is critical. The goal should be to target conservation practices to the areas of the landscape where they will be most effective to meet local and regional water quality and ecosystem goals and objectives. New tools and technologies are making it possible to target conservation practices to specific areas of the landscape (see attached brochure).

State agencies are working together to support the development of new technologies and to make them available to local partners through training and online resources. This area of research is developing and more tools such as digital terrain analysis, are made available each year. These resources should be used whenever possible. A multi-faceted approach to implementing BMPs on the landscape is an important component of preserving, conserving, enhancing and sustaining water and natural resources.

It is recommended that consideration be given towards further developing and enhancing relations with all local conservation partners to align goals, objectives and outcomes of local plans to meet local water quality goals. It is recommended that the authors of the local water plan continually review and acknowledge areas of shared concern and opportunity between complementary plans and to foster new partnerships. Considerations should be given for further engaging the agricultural sector while developing new plans or updating existing plans. Agricultural producers involved with local TMDL implementation plans, local water management plan advisory committees, NRCS local workgroups and other local committees can provide additional insight into agricultural landscape management.

What actions are needed?

- Utilize targeting tools and technologies to locate BMPs and conservation structures as per the attached factsheet on targeting tools.
- Consider and implement multifaceted approaches to working with agricultural producers.
- Further engage local partners on conservation implementation such as NRCS staff, local conservation groups, lake associations, etc.
- Foster new relationships with the agricultural sector or enhance existing relations. Consider joint meetings of NRCS local work groups and local water management plan advisory committees.

What resources may be available to accomplish the actions? Agricultural producers are key stakeholders in working with local, state and federal agencies on implementing positive changes within the agricultural landscape. The following MDA website was developed to encourage producers to become involved at the local level with impaired waters issues: http://www.mda.state.mn.us/protecting/cleanwaterfund/coordination.aspx

Also, the Minnesota Agricultural Water Resources Coalition may be able to provide additional expertise on engaging agricultural producers in your county. For more information, please refer to: http://www.mawrc.org/

Minnesota Conservation Funding Guide: More detailed information about funding opportunities can be found in "The Conservation Funding Guide". This guide complements, but does not replace the customized local expertise available via SWCDs and other local units of government to landowners throughout Minnesota. The guide provides contact information for Minnesota's 90 local SWCDs and other organizations that help landowners plan and implement conservation. The guide can be found at these websites:

http://www.mda.state.mn.us/conservationfundingguide or http://www.youtube.com/watch?v=gmqvfcfLXNA

What area(s) of the county is high priority? All areas of the county.

MDA CONTACT INFORMATION:

MDA Livestock/Feedlot Contact:
Curt Zimmerman
Program Supervisor
Livestock Development Team
651-201-6456
Curt.Zimmerman@state.mn.us

MDA Drainage Contact: Mark Dittrich
Senior Planner
Conservation Drainage
Mark.Dittrich@state.mn.us
651-201-6482

Agricultural Nutrients in Groundwater and Irrigation Contact:
Bruce Montgomery
Unit Supervisor - Fertilizer Management Unit
Bruce.Montgomery@state.mn.us
651-201-6178

MDA Surface Water Impairments Contact:
Adam Birr, Ph.D.
Impaired Waters Tech Coordinator
507-206-2881
Adam.Birr@state.mn.us

MDA Pesticides Contact:
Gregg Regimbal
Ag Chem. Reg/Fac. Supervisor
651-201-6671
Gregg.Regimbal@state.mn.us

MDA Environmental Outreach Contact:
Margaret Wagner
Environmental Outreach Coordinator
651-201-6488
Margaret.E.Mangan@state.mn.us

MDA Local Water Plan Review Contact:
Robert Sip
Environmental Policy Specialist
651-201-6487
Rob.Sip@state.mn.us

MDA GIS/MAP Contact:
Kimberly Kaiser
Nitrate Hydrologist
651-201-6280
Kimberly.Kaiser@state.mn.us

MDA Targeting Tools Contact:
Barbara Weisman
Conservation Program Specialist
651-201-6631
barbara.weisman@state.mn.us

In accordance with the Americans with Disabilities Act, an alternative form of communication is available upon request.

TDD: 1-800-627-3529. MDA is an Equal Opportunity Employer.

Minnesota Department of Agriculture, 625 Robert Street North, St. Paul, MN 55155-2538, www.mda.state.mn.us
800-967-AGRI (2474)