



Working *Together*
to address nitrate in groundwater

Groundwater Protection Rule Framework

Purpose of This Meeting

We want you to leave this meeting with an understanding of the rule framework, timeline, opportunities for involvement, and the tools to talk about the rule with your membership.

Foundation for the Rule

- The Minnesota Department of Agriculture (MDA) is the lead state agency for the management of fertilizer and for addressing nitrate from fertilizer in groundwater
- The Groundwater Protection Act (Chapter 103H) outlines specific requirements and a process to address contamination in groundwater
- The Nitrogen Fertilizer Management Plan (NFMP) is the state's blueprint for minimizing groundwater impacts from the use of nitrogen fertilizer
- The Groundwater Protection Rule is based on the approach in the NFMP
- Our goal is to work with local farmers and agronomists to promote science based and economically viable practices to reduce nitrate in groundwater

Foundation for the Rule

- 1989 – Groundwater Protection Act passed
- 1990 – First Nitrogen Fertilizer Management Plan (NFMP) drafted
- 2010 to 2015 – NFMP revision
 - Advisory committee of farmers, agronomists, commodity groups, and environmental organizations
 - 420 written comments
- Summer 2017 – Draft Groundwater Protection Rule released for informal comment
 - 17 listening sessions across the state
 - 1,500 attendees
 - 820 written comments

Nitrate Leaching from Fertilizer

- A very challenging problem
- Under row crop production in vulnerable soils, nitrate leaching will occur
- Losses may vary significantly between years due to weather
- May be long lag times (*years*) between changes in practices and changes in groundwater quality
- Enormous variability *between* and *within* aquifers

There is no simple solution

Part 1: Nitrogen Fertilizer Application Restrictions in Vulnerable Groundwater Areas

- If you farm in a vulnerable groundwater area, you will not be able to apply nitrogen fertilizer in the fall or on frozen soils
- Criteria include coarse textured soils, shallow bedrock, or karst geology
- Vulnerable groundwater areas will be determined quarter-section by quarter-section
- If 50% or more of a quarter-section is vulnerable, fall application will not be allowed in the entire quarter-section
- The MDA web site will have a zoomable interactive vulnerable area map

Part 2: Mitigation Efforts in DWSMAs with Elevated Levels of Nitrate

- The goal of Part 2 is to take action before a public water system exceeds the health standard of 10 mg/L nitrate-N (nitrate-nitrogen)
- It is designed so the MDA partners with local farmers and their agronomists to find the best approaches to improve water quality
- Two levels are voluntary, two are regulatory
- Always starts with one of the voluntary levels
- Becomes regulatory only if BMPs are not voluntarily adopted or if nitrate contamination increases

Part 2: Mitigation Efforts in DWSMAs with Elevated Levels of Nitrate

- There are 4 levels: Levels 1 and 2 are voluntary, levels 3 and 4 are regulatory.
 - Level 1: DWSMAs that are at 5.4 to less than 8 mg/L nitrate-N.
 - Level 2: DWSMAs that have exceeded 8 mg/L at any point during the previous 10 years **or** are projected to exceed 10 mg/L in the next 10 years.
 - Level 3: After three growing seasons the BMPs are not adopted on 80% of the cropland acres (excluding soybean acres) **or** after three growing seasons the residual soil nitrate below the root zone increases **or** after three growing seasons or the estimated lag time, whichever is longer, the nitrate concentration continues to increase.
 - Level 4: If nitrate-N in the public water supply well exceeded 9 mg/L for any three samples in the previous 10 years; or after three years the residual soil nitrate below the root zone increases; or after three years or the estimated lag time, whichever is longer, the nitrate levels continue to increase.

What's at Stake for Community Water Suppliers Dealing with Nitrate Problems?

- A public water supply system cannot exceed the health standard for nitrate
- Nitrate removal systems typically costs millions for upfront construction in addition to long-term operations and maintenance costs
- May be costs for drilling new wells
- May have to blend water from multiple wells to achieve acceptable water quality
- Consumer costs are 2-6 times higher than non-impacted water supplies



Overview of Changes Since the 2017 Draft

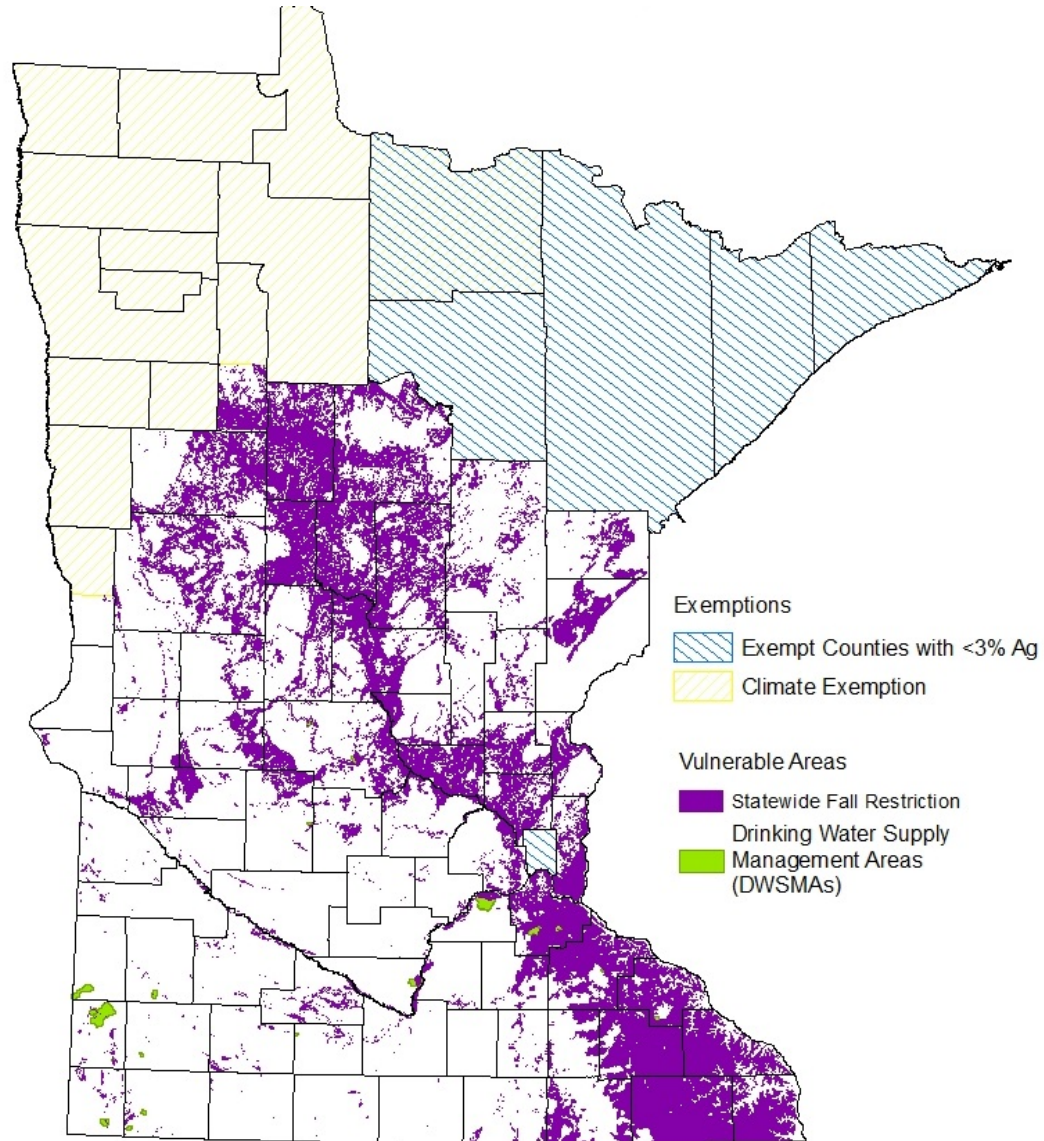
		June 2017	March 2018
Part 1 – Statewide Restrictions on Nitrogen Fertilizer Application in the Fall and on Frozen Soil	Vulnerable Groundwater Area Definition	Areas with vulnerable groundwater were defined using a method that measured how water moved through a 5 foot soil profile (KSAT) and karst geology	<ul style="list-style-type: none"> • Areas with vulnerable groundwater defined based on USDA NRCS soil maps and shallow bedrock and karst geology • DWSMAs \geq 5.4 mg/L
	Field Determination Criteria	Used full sections to determine if Part 1 of the rule applied to individual fields	Uses quarter-sections determine if Part 1 of the rule applies to individual fields
	County-level exclusions	Provided no county-level exclusions	Excludes counties based on their low risk for nitrate contamination in groundwater due to climate and minimal row crops
Part 2 – Mitigation Efforts	Eligibility Criteria	Applied to both townships and DWSMAs	Applies to DWSMAs \geq 5.4 mg/L
	Criteria for moving to regulatory level	Only if BMPs not implemented on 80% of cropland	<ul style="list-style-type: none"> • If BMPs not implemented on 80% of cropland • Added if nitrate levels are increasing in monitored wells or in soil below root zone
	Commissioner's orders	Could only require BMPs	<ul style="list-style-type: none"> • Can require additional practices in level 3 if funded • Can require additional practices in level 4 (but cannot restrict selection of primary crop or set N rates below lowest U of M recommended rate)

Changes to Part 1 of the Rule Since the 2017 Draft

Part 1 of the rule deals with restrictions on nitrogen fertilizer in the fall and on frozen soil in vulnerable groundwater areas.

- Vulnerable soils are defined as:
 - Coarse textured soils based on USDA NRCS soils maps (not KSAT)
 - Shallow bedrock based on USDA NRCS soils maps (not DNR maps)
 - Karst geology (no change)
- Added Drinking Water Supply Management Areas (DWSMAs) for public water supplies exceeding 5.4 mg/L nitrate-N.
- Changed the mapped area subject to restrictions to quarter-sections where 50% or more is vulnerable. Previously it was mapped by full sections.
- Added an exclusion for counties with low leaching potential based on precipitation and evapotranspiration rates and a short planting season.
- Added an exclusion for counties where less than 3% of the land is used for cropland.

Fall Restrictions Map



Changes to Part 1 Exemptions Since the 2017 Draft

- Increased the allowed nitrogen rate from 20 pounds to an average of 40 pounds per acre when applying ammoniated polyphosphate (MAP and DAP) or micronutrient formulations.
 - Fields that have very low to low phosphorus levels are not subject to the 40 pounds per acre total nitrogen limit.
- Added exceptions for specific crops including winter grains, perennial crops, grass seed, cultivated wild rice, and fall cover crops.
- Specified an effective date of January 1, 2020 to provide enough notice for entities that need to order and ship fertilizer.

Part 1 Statistics

Cropland Acres with Fall/Winter Application Restrictions

- Estimated number of cropland acres classified as vulnerable: 2.6 million
- Estimated percent of statewide cropland: 12.6%

Changes to Part 2 Since the 2017 Draft

- The rule will prioritize protecting DWSMAs. The goal is to prevent source water from exceeding the health standard of 10 mg/L nitrate-N.
- There will be no regulatory component for townships.
 - Voluntary Township Testing and NFMP activities such as forming local advisory teams, promoting BMPs, and evaluating BMP adoption, will continue to occur in townships.
- Mitigation level 2 DWSMA criteria decreased from 9 mg/L to 8 mg/L nitrate-N.
- Criteria for moving up levels in DWSMAs now include:
 - Increasing nitrate levels in groundwater, or
 - Increases in residual soil nitrate below the root zone.

Changes to Part 2 of the Rule Since the 2017 Draft

- The timeframe for evaluating changes in water quality has been modified to include the vertical lag time for nitrate to reach groundwater and travel time within an aquifer to reach the impacted well.
- Soybean acres are NOT included in the evaluation of BMP adoption.
- Commissioner's Order
 - DWSMA Level 3
 - BMPs
 - Alternative Management Tools (AMTs) may be required if funded.
 - DWSMA Level 4 – Commissioner can order any practices allowed by the Groundwater Protection Act. These likely will be AMTs. There are two limitations:
 1. The Commissioner cannot restrict selection of the primary crop, and
 2. The nitrogen rate cannot be below the lowest University of Minnesota recommended rate.
- The Commissioner can grant a one-time exemption to delay entering each regulatory level if there is demonstrated progress.

Before Farmers are Required to Follow Practices

- The Local Advisory Team (LAT) recommends appropriate BMPs
- The recommended BMPs are published and promoted
- BMP adoption is evaluated
- A local monitoring network may be installed in the DWSMA
- The LAT will also evaluate suitable Alternative Management Tools (AMTs)
- Commissioner required to seek LAT before imposing water resource protection requirements

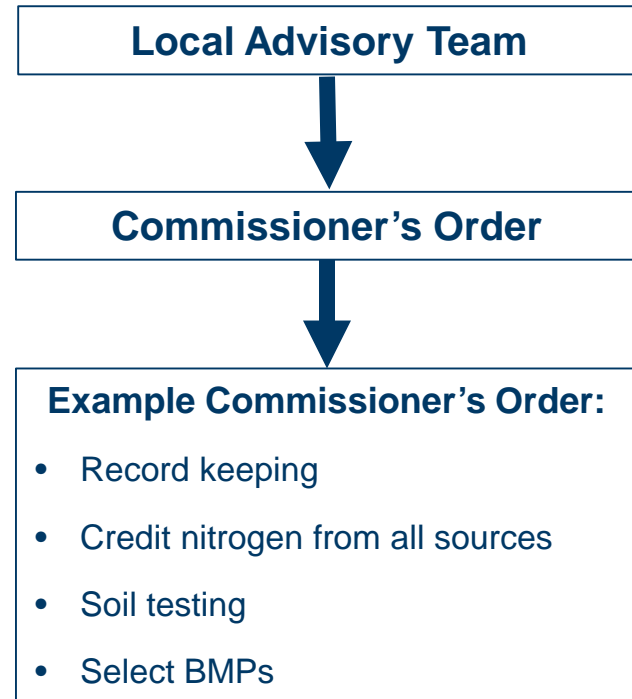
Alternative Management Tools (AMTs)

- Precision agriculture
- Cover crops
- Use of perennials
- Lower nitrogen use varieties
- Highly targeted lands swapped or taken out of production
- New technologies and practices added over time

Example Commissioner's Order Process

Example Regulatory Options:

- Appropriate Regional BMPs
- Record keeping
- Attend training
- Collect well water samples
- Credit N from previous crop and manure
- Soil testing
- Nitrification inhibitor
- Irrigation management



Part 2 Statistics

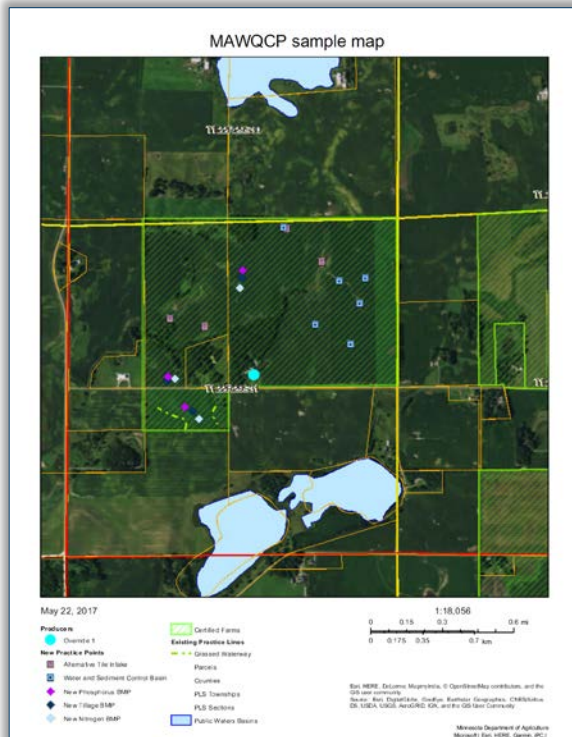
Drinking Water Supply Management Areas

- Estimated number of cropland acres currently in DWSMAs subject to the rule: 97,580 acres
- Estimated percent of statewide cropland: 0.45%

Rulemaking Timeline and Next Steps

- **Spring 2018:** MDA staff completes the draft of the rule and the Statement of Need and Reasonableness. MDA begins outreach to stakeholders to explain the content of the proposed rule.
- **Early May 2018:** MDA publishes the draft Groundwater Protection Rule and Statement of Need and Reasonableness. **A 60 day formal public comment period begins with the publication of the rule.** MDA reviews comments and considers changes to the rule.
- **July 2018:** **Hearings are held at various locations before an Administrative Law Judge (ALJ).** Any interested person may testify.
- **Summer 2018:** **Post-hearing comment period. Agency and interested parties can submit written comments.**
- **Fall 2018:** Administrative Law Judge completes report, gives MDA time to respond to ALJ report.
- **December 2018:** MDA submits the final Groundwater Protection Rule to the Office of Administrative Hearings, the Office of the Revisor of Statutes, and the Governor.
- **January 2019:** Governor signs final Rule.
- **January 2020:** Fall fertilizer application restriction goes into effect.

Minnesota Agricultural Water Quality Certification Program



- Certification = deemed to be in compliance with the Rule
- MAWQCP offers producers:
 - Recognition
 - Financial/Technical assistance
 - Regulatory certainty
 - Branding/Marketing opportunity
 - Check-up/Validation for growers
- Whole-farm planning for water quality; risk assessment of every parcel, every crop
- Pairs producers with professionals to develop **site-specific** solutions for risks to water quality



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Questions & Answers