Nitrate in Private Wells: Minnesota's Response

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Minnesota Department of Health

DEPARTMENT OF HEALTH

Overview of Presentation

- Background
  - EPA directive received November 2023
  - Private wells in Minnesota
- Minnesota's response to EPA directives
  - MDH
  - MDA
  - MPCA

Background

- **April 2023**: Group of 10 stakeholders led by the Minnesota Center for Environmental Advocacy filed a petition with U.S. Environmental Protection Agency (EPA) Region 5 under Section 1431 of the federal Safe Drinking Water Act.

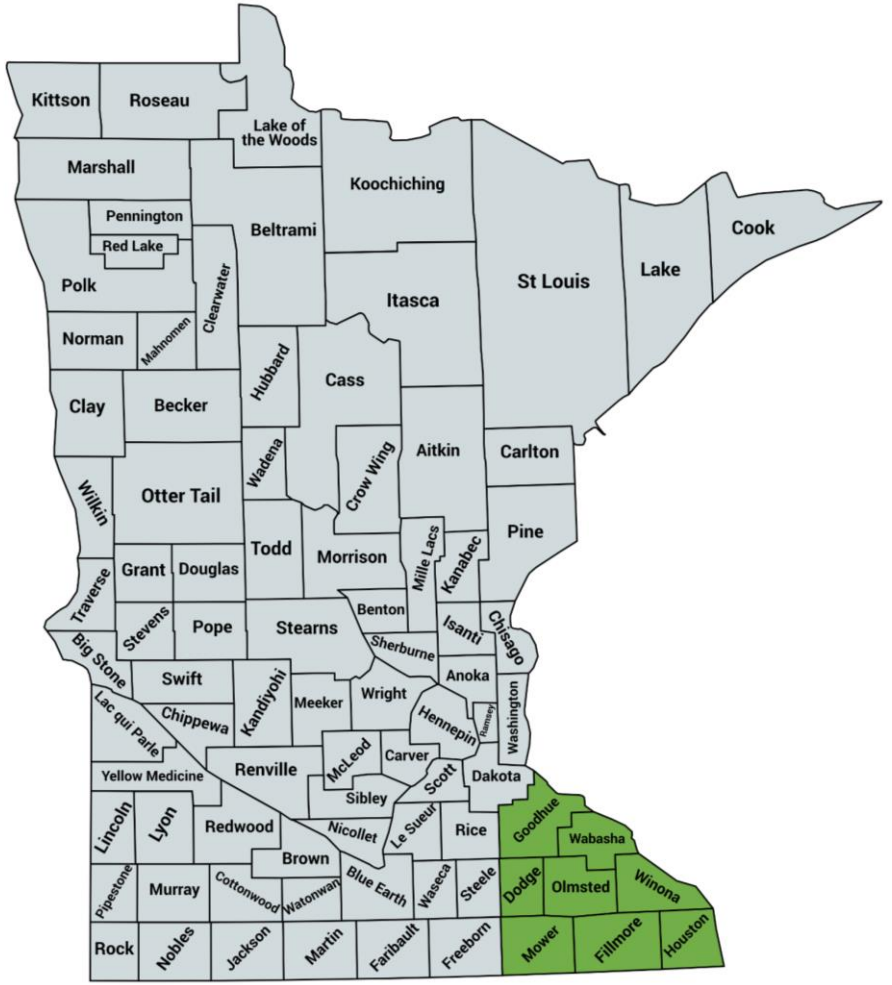
- **November 3, 2023**: EPA requested the Minnesota Department of Health (MDH), Minnesota Pollution Control Agency, and Minnesota Department of Agriculture **develop a coordinated and comprehensive work plan to reduce nitrate contamination of drinking water aquifers in eight southeastern Minnesota counties**.

  - 8 counties: Dodge, Fillmore, Goodhue, Houston, Mower, Olmsted, Wabasha, and Winona.

- Letter and Minnesota's response available here: **Response to EPA Nitrate Letter for Southeast Minnesota**

EPA Directives to Minnesota

1. Develop coordinated communication plan
2. Identify all private wells
3. Provide education and outreach:
   - Private wells owners/users
   - Community water system customers
4. Offer testing for all private wells
5. Offer mitigation for wells that exceed drinking water guidance
6. Establish public access to data and records
7. Report quarterly to EPA



State Agencies Response Includes Three Phases

Phase I: Immediate Response
Jan-Jun 2024

- Conduct education and outreach encouraging well testing
- Provide limited alternate water for vulnerable populations

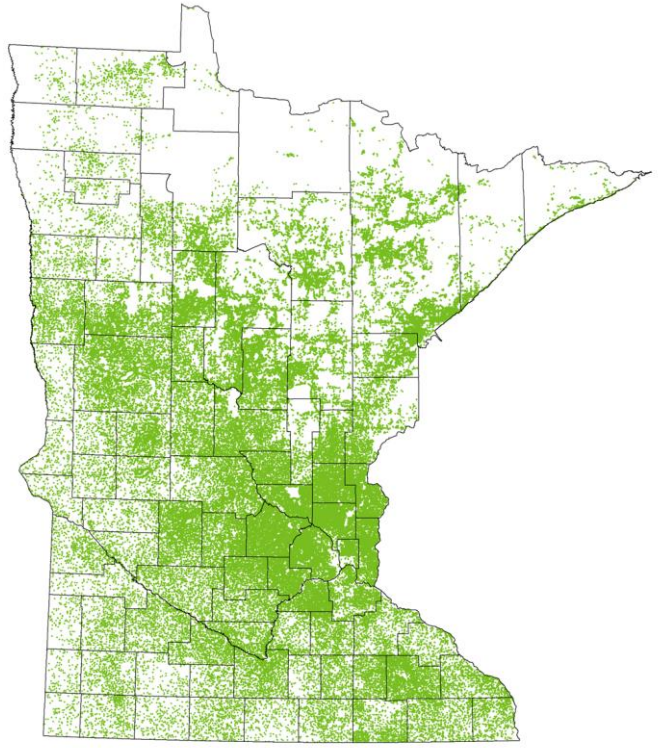
Phase II: Public Health Intervention
Jul 2024 forward

- Identify impacted residences
- Conduct education and outreach
- Test private well drinking water
- Provide mitigation
- Provide public record of work

Phase III: Long-Term Nitrate Strategies
Long-term

- Taskforce to address nitrate
- Nitrogen Fertilizer Management Plan and Groundwater Protection Rule
- Feedlot permits and rules
- Revising MN Nutrient Reduction Strategy
- Fish kill prevention
- Wastewater nitrogen reduction and karst protection strategies

At least 1.1 million private well users in Minnesota



Minnesota: 1 in 5 people depend on a private well

Southeast Minnesota: about 1 in 4 people (~94,000)

The Minnesota Well Code

- ***Protects public health***
- ***Protects groundwater from degradation***
- ***Determines:***
  - **Well location**
  - **Well construction**
- ***Licenses well contractors***
- ***Requires sealing of unused wells***

Only one test is required

- Bacteria - since 1975; must pass test before well can be used
- Nitrate -since 1975

  About 1% exceed 10 mg/L
- Arsenic - since 2008

  About 12% exceed 10 ug/L

Any treatment depends on the well owner

No additional testing or treatment required

What are we concerned about in private wells?

Protect your health!

Test your well water for:

- **Coliform Bacteria** (Every year)
- **Nitrate** (Every year)
- **Arsenic** (At least once)
- **Lead** (At least once)
- **Manganese** (At least once)

Testing is even more important if young children drink the water.

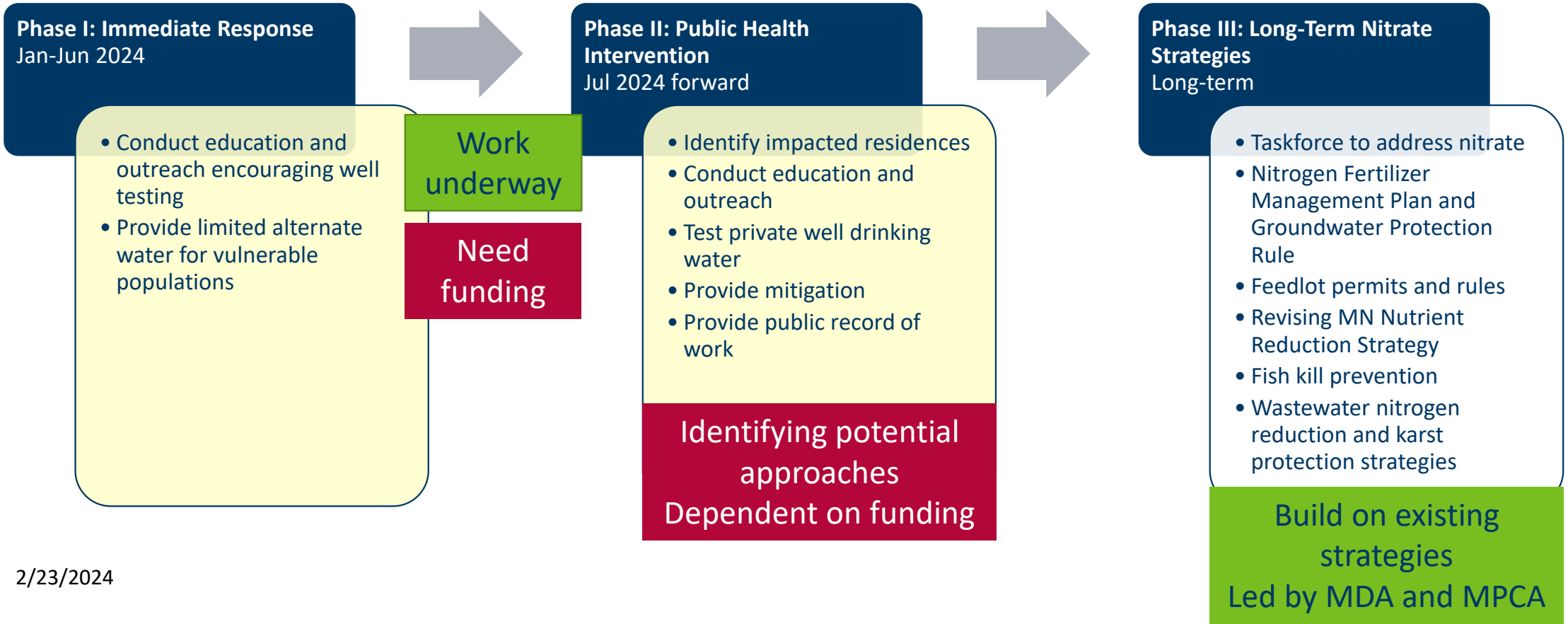
Disparities in safeguards over the lifespan of a well

Phase	Construction	Regular testing to ensure safe drinking water	Mitigation to address contaminants	Protecting source waters	Funding for construction, treatment, repair, sealing	Well Sealing
Public Water System						
Private Well		Initial test 			Disparate & limited funds 	

Well users don't choose their geology or how land is used around them

Southeast Minnesota Response: Three Phases

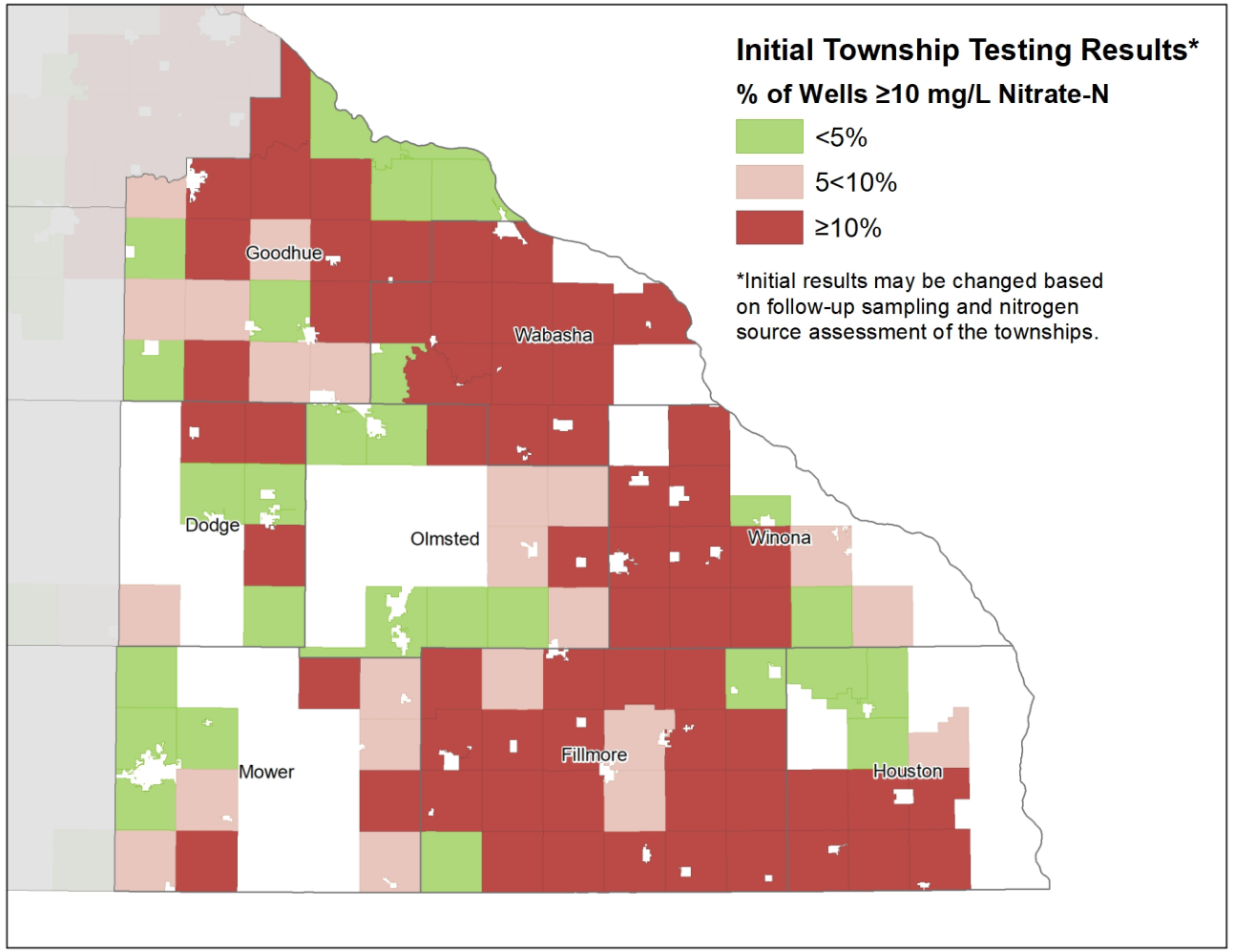
1. Initial response letter sent December 1, 2024
2. Workplan submitted January 12, 2024



The concern is with private wells

- Community water systems: Safe Drinking Water Act protects consumers
- Private wells have little protection:
  - Well Code regulates construction, sealing
  - Owner responsible for testing, mitigation, operation
  - Pre-code wells are very vulnerable

Township Testing results for 8 county area



Nitrate

Level of concern: 10 milligrams per liter (mg/L) and above

Health risks:

- Affects how blood carries oxygen and can cause blue baby syndrome, which can be deadly
- Bottle-fed infants under 6 months at highest risk

Wells at higher risk:

- Wells in porous soils or porous geology
- Wells in areas with row crop agriculture or animal feedlots
- Shallow wells
- Pre-code wells

Phase I: Immediate Response

January – June 2024 led by MDH

Outreach

- Messages and educational materials through local partners
- Paid social media, news releases and radio spots

Provide limited alternate water:

- Prioritize households with pregnant person or baby
- MDA may provide treatment to eligible households who participated in Township Testing
- MDH pursing additional possibilities, still determining

Phase II: Public Health Intervention

July 2024 forward led by MDH

- **Identify impacted residences** through a well inventory
- **Conduct education and outreach** about how to get well water tested and mitigation assistance
  - Direct mailing
  - Billboards
- **Offer free private well testing**
- **Provide mitigation**: well repairs, well sealing, potentially treatment
- **Provide public record of work**
  - Data visualizations and maps of nitrate in private wells in southeast Minnesota
  - Dashboard on progress

Phase II Partnership with the TAP-IN Collaborative

Leverage and elevate the TAP-IN Collaborative

- Established through a MDH Clean Water Fund pilot grant to offer free well testing and income-based remediation
- Partnership between local public health and soil and water conservation districts in the 8 counties

Thank you

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DEPARTMENT OF AGRICULTURE

Overview of MDA Nitrate Work & Response to EPA's Petition

Senate Agriculture & Environment Committees – February 26, 2024

MDA's Work on Nitrate

- The MDA has taken significant actions over the past decade to address nitrate concerns.
- Minnesota Ag Water Quality Certification Program
  - The program assesses whole-farm risks to water quality and invests in conservation practices that protect our water resources.
  - Since the program began in 2014, MAWQCP has certified over 1 million areas statewide. There are 269 MAWQCP-certified producers operating over 191,000 acres (as of December 31, 2023) in southeast Minnesota.
- AgBMP Loan Program
  - The AgBMP Loan Program is a water quality program that provides low-interest loans to farmers, rural landowners, and agriculture supply businesses.
  - In southeast Minnesota, 284 loans totaling nearly $12 million have been invested in projects from January 1, 2019 – December 4, 2023.
- Nitrogen Fertilizer Management Plan and Groundwater Protection Rule

MDA's Statutory Authority Over Nitrate

The MDA is responsible for management of pesticides and fertilizers, measures and assesses concentrations in streams, lakes, and groundwater; measures water quality and quantity at the edge of agricultural fields

Minn Statute Chapter 18C: Fertilizer, Soil Amendment, and Plant Amendment

- The Department of Agriculture is the lead state agency for the regulation of fertilizer, including storage, handling, distribution, use, and disposal of fertilizer.

Minn Statute Chapter 103H: Groundwater Protection

- The Department of Agriculture is responsible for the development, promotion and evaluation of best management practices (BMPs) for agricultural chemicals and practices.
- The Department of Agriculture is the lead agency for monitoring agricultural chemicals in the environment.

Minnesota Rules Chapter 1573: Groundwater Protection Rule

- Minimizes potential sources of nitrate pollution to the state's groundwater and protects our drinking water

Status of the Three Phases

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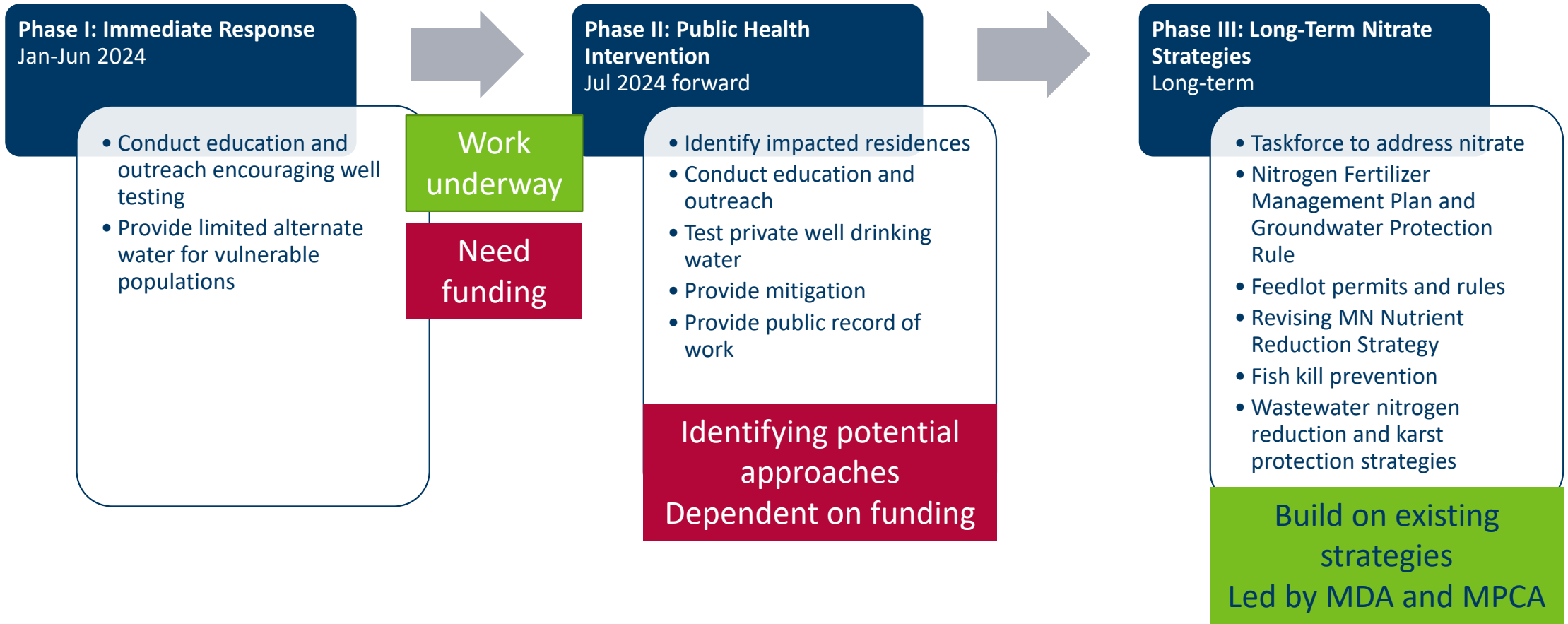
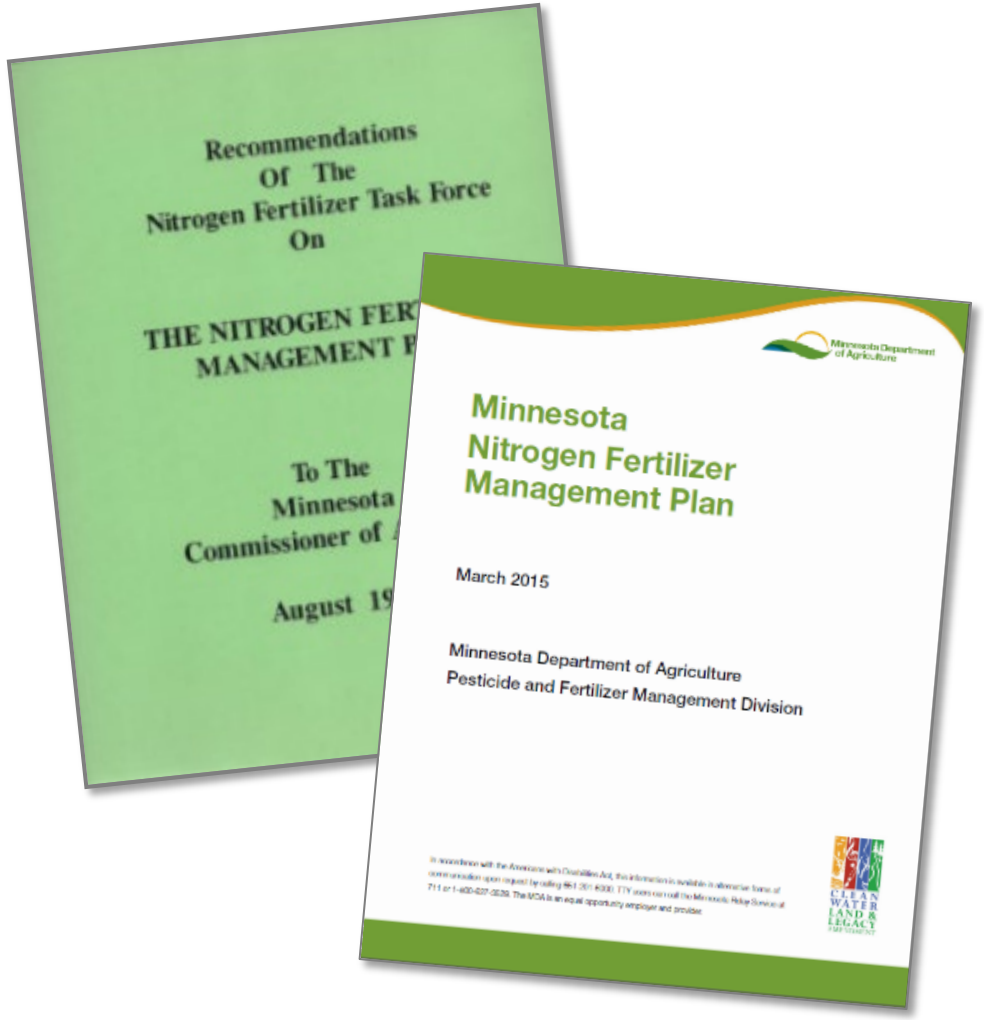
2. Workplan submitted January 12, 2024



Nitrogen Fertilizer Management Plan (NFMP)

Minnesota's blueprint to minimize groundwater impacts from the use of nitrogen fertilizer

- Written in 1990 and updated in 2015
- Key outcomes:
  - Township Testing Program (2013-2019)
  - Prioritization of areas with elevated nitrate in groundwater
  - Engagement of local agricultural community in problem solving
  - Groundwater Protection Rule

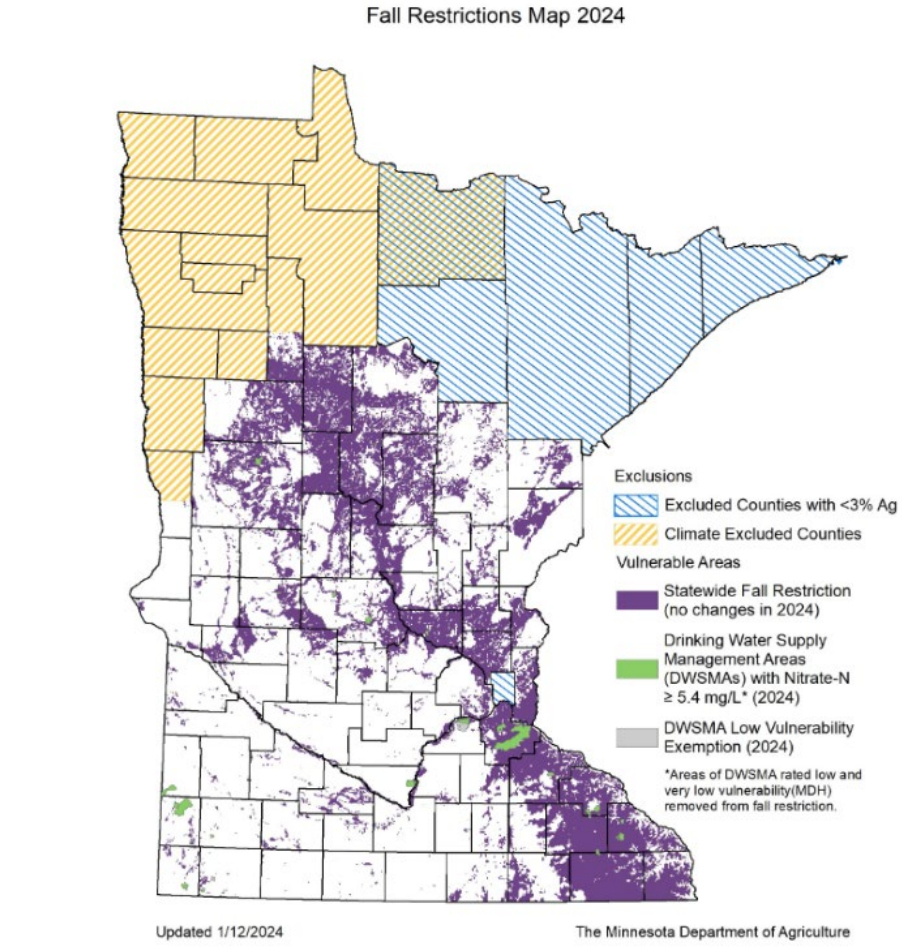


Minnesota's Groundwater Protection Rule

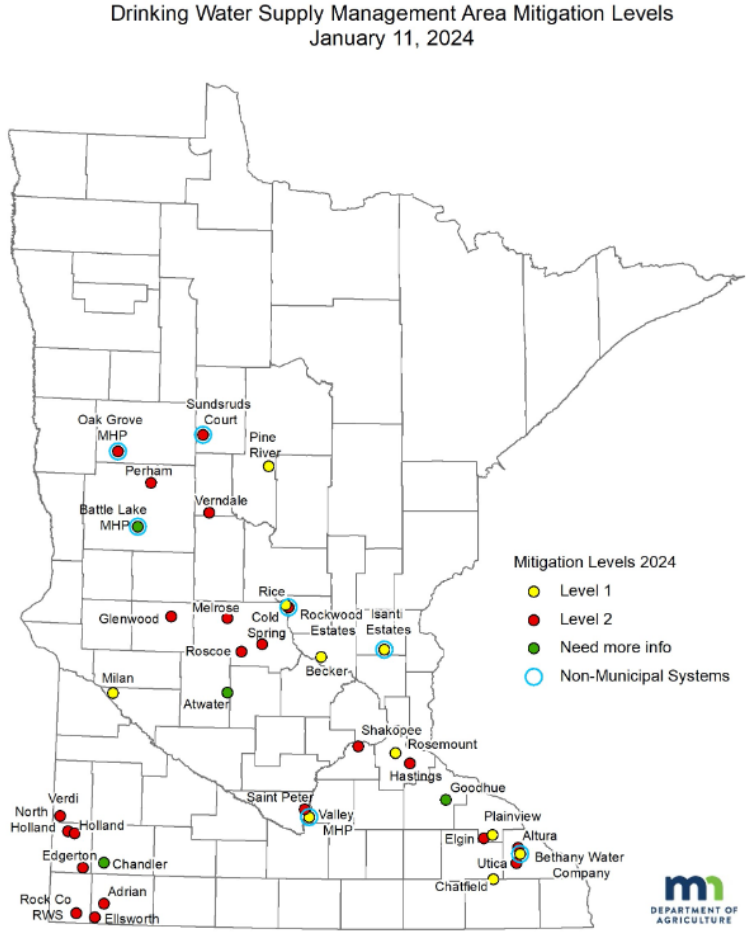
- The Groundwater Protection Rule applies to the use of nitrogen fertilizer.
- It focuses on protecting groundwater in areas vulnerable to groundwater contamination.
- It went into effect on June 24, 2019.
- The Rule contains two parts. Each part contains separate criteria and requirements.

Minnesota's Groundwater Protection Rule

Part 1 - Restricts nitrogen fertilizer application in fall and on frozen soils



Part 2 - Applies to DWSMAs with elevated nitrate-N levels in the well water



Groundwater Protection Rule Working in Southeast MN

- Part 1 restricts fall application of commercial fertilizer on 1.1 million acres (71% of cropland) in SE counties.
- Part 2 applies to three Level 1 and three Level 2 communities with elevated nitrate in the community water supply.
- The MDA has convened local advisory teams in all Level 2 communities, meeting with farmers and crop advisors to develop a list of best management practices.
  - Emphasis on nitrogen management and increasing vegetative cover
  - Positive voluntary actions, including first commercial acres of Kernza®, evaluation of BMPs for water quality, and adoption of conservation practices
- The MDA has contributed to the foundational science and understanding of how groundwater, and contaminants like nitrate, move in SE and the timeline for monitoring changes.

Continued Phase Three Nitrate Work

- Further promote Minnesota Ag Water Quality Certification (MAWQCP)
- Support Soil & Water Conservation Districts
- Enhanced partnerships with crop retailers for nitrogen management
- New opportunities for Forever Green perennial and winter annual crops
- Accelerate work in townships with elevated nitrate
  - Vegetative cover (alfalfa, perennials, and cover crops), extended crop rotations including small grains, and fine-tuning total nitrogen rate and timing.

MINNESOTA POLLUTION CONTROL AGENCY

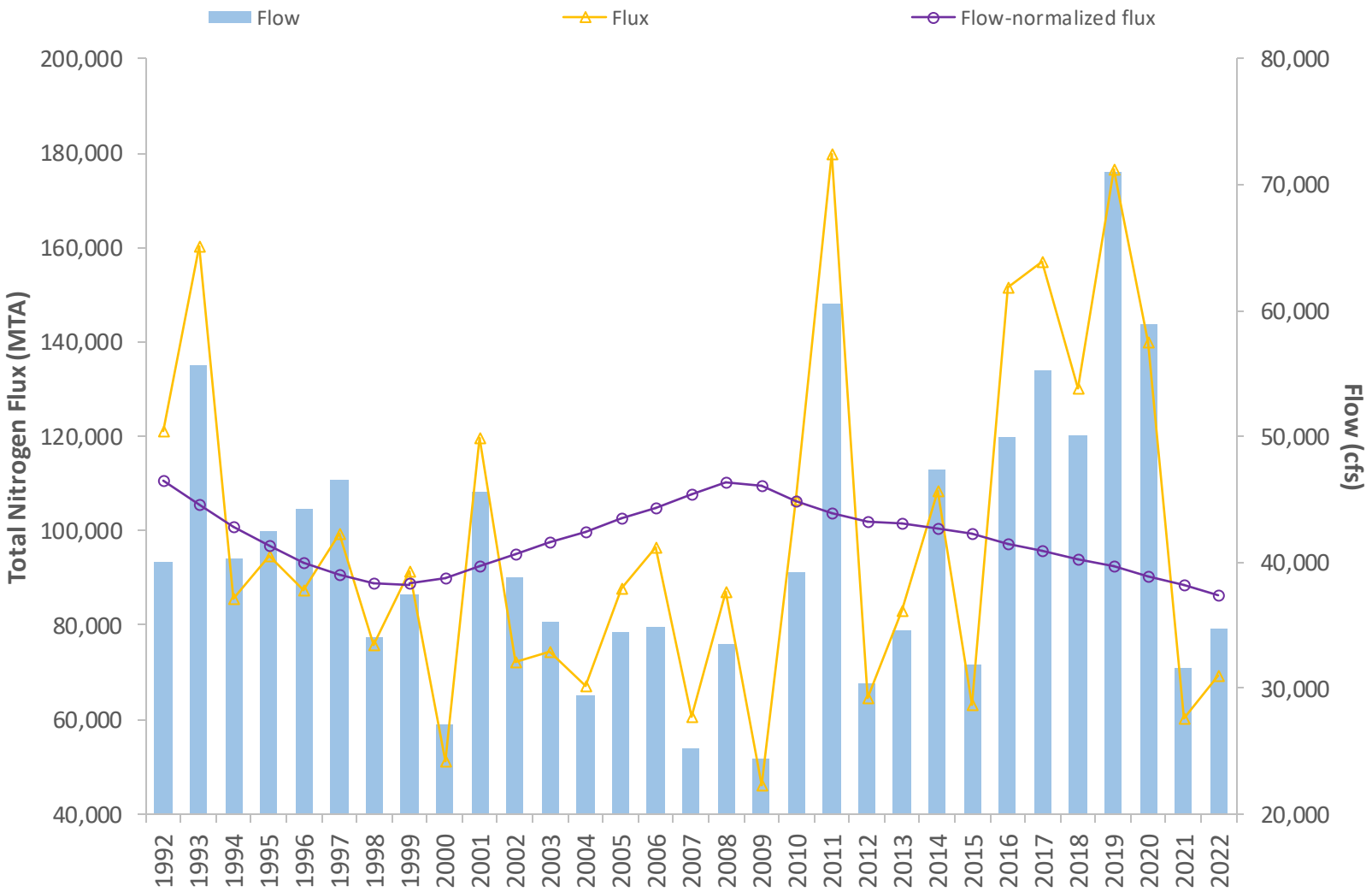
Addressing Nitrates in Southeastern Minnesota

Katrina Kessler, P.E. | Commissioner

Dana Vanderbosch, M.S. | Assistant Commissioner

February 26, 2024

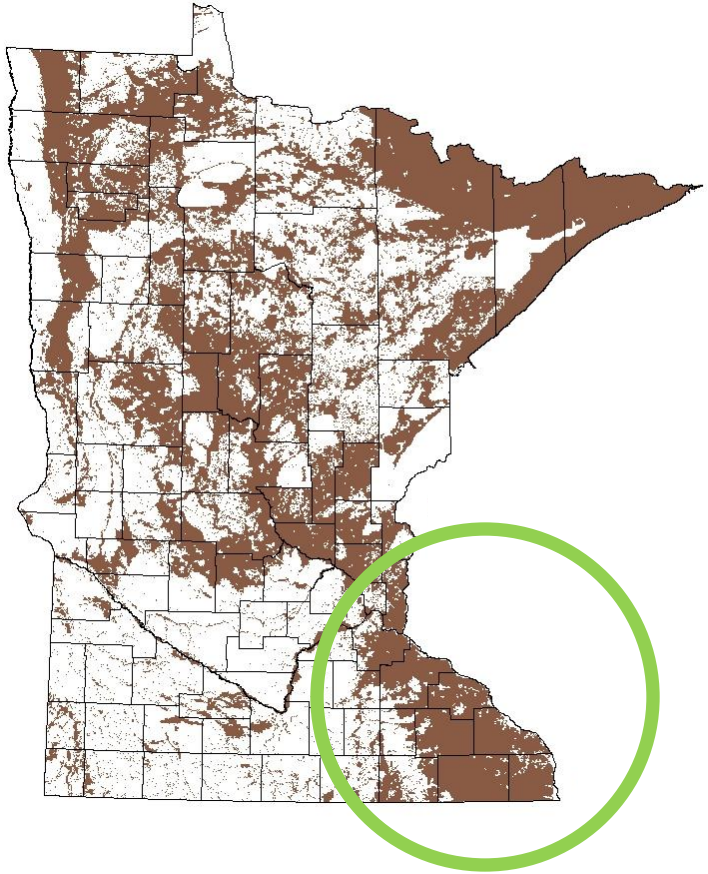
Nitrate levels in the Mississippi River in SE Minnesota



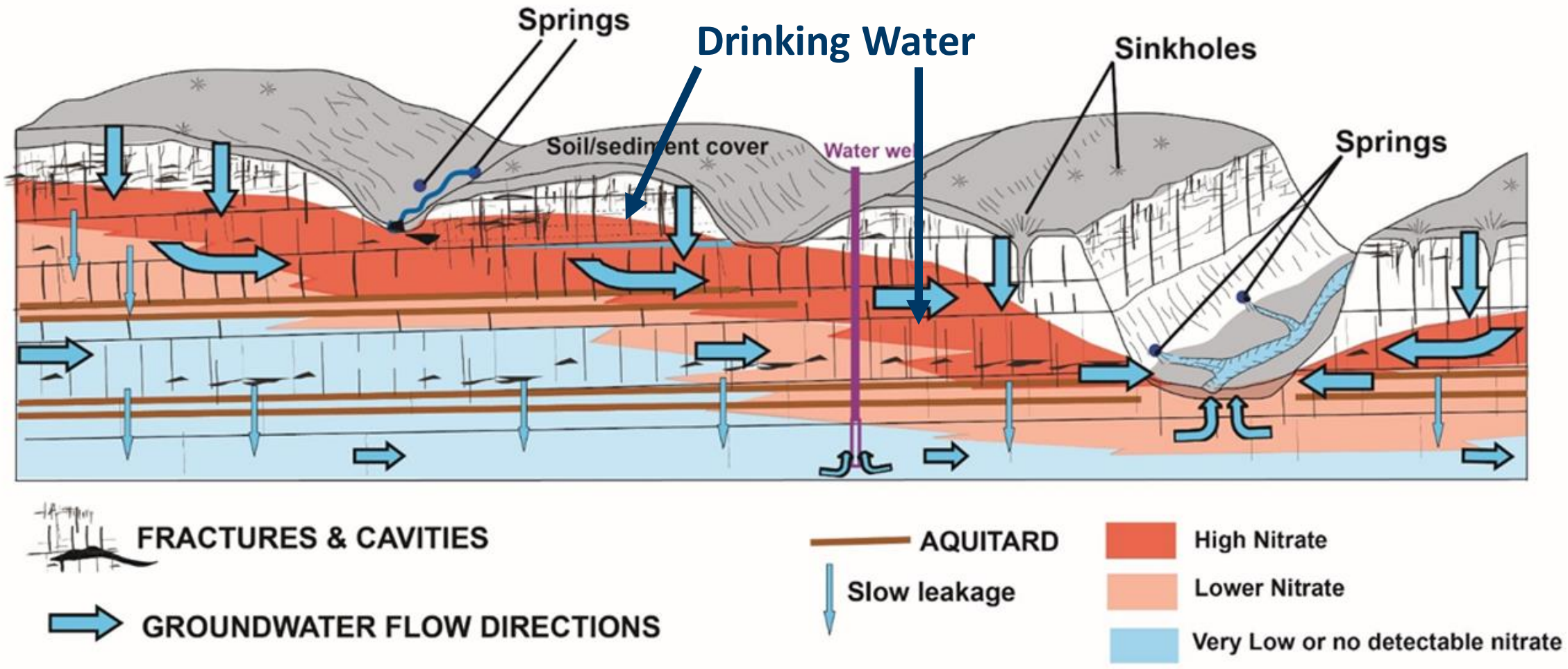
Nitrate levels in the Mississippi River in southeastern Minnesota have decreased since 2008, but we need to accelerate work.

Karst geology poses greater risk to groundwater

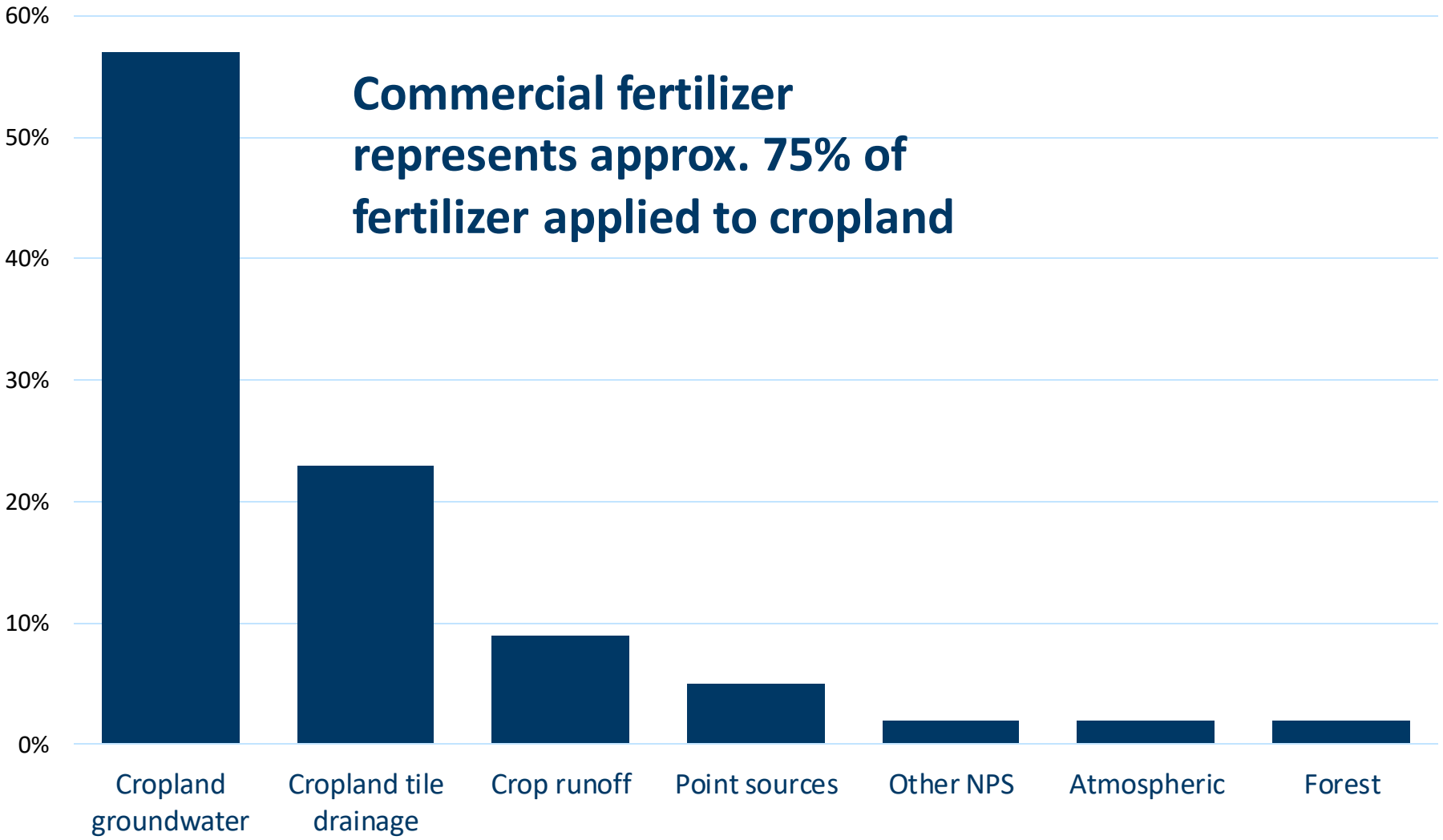
Minnesota's vulnerable groundwater areas



Nitrate moves quickly into groundwater and surface water



Sources of nitrate in southeastern Minnesota



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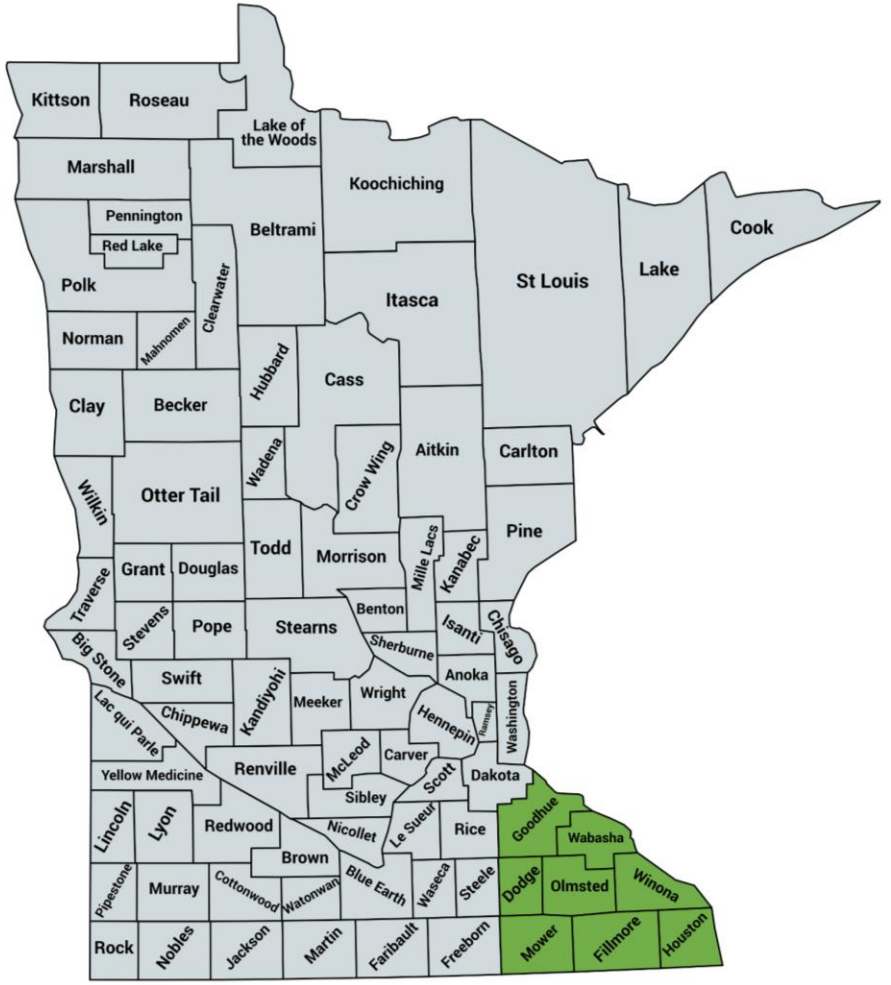

MPCA's work in phase III

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Jan-Jun 2024

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Jul 2024 forward

- Identify impacted residences
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Phase III: Long-Term Nitrate Strategies
Long-term

- Nitrogen Fertilizer Management Plan and Groundwater Protection Rule
- Update feedlot permits and regulations
- Revise MN Nutrient Reduction Strategy
- Wastewater nitrogen reduction and karst protection strategies
- Engage residents to develop additional strategies

MPCA programs that address nitrogen

Regulatory programs

- Feedlot permits
- Municipal wastewater permits
- Industrial wastewater permits

Non-regulatory programs

- Water monitoring, modeling, assess data
- Research to advance knowledge
- Strategies to protect and restore state waters-->inform local planning and implementation

Nutrient Reduction Strategy update 2023-2025

State-level Support

- BMPs
- Science
- Goals/targets
- Tools & resources
- Programs
- Track progress

MINNESOTA

Local watershed work

Rural & urban BMP practice adoption

Improve local waters

- Reduce algae
- Improve drinking water, biological health

Future feedlot permit and rule updates

Approx. 2,600 feedlots are registered in Southeastern Minnesota.

Less than 100 feedlots are permitted.

Wastewater nutrient reduction

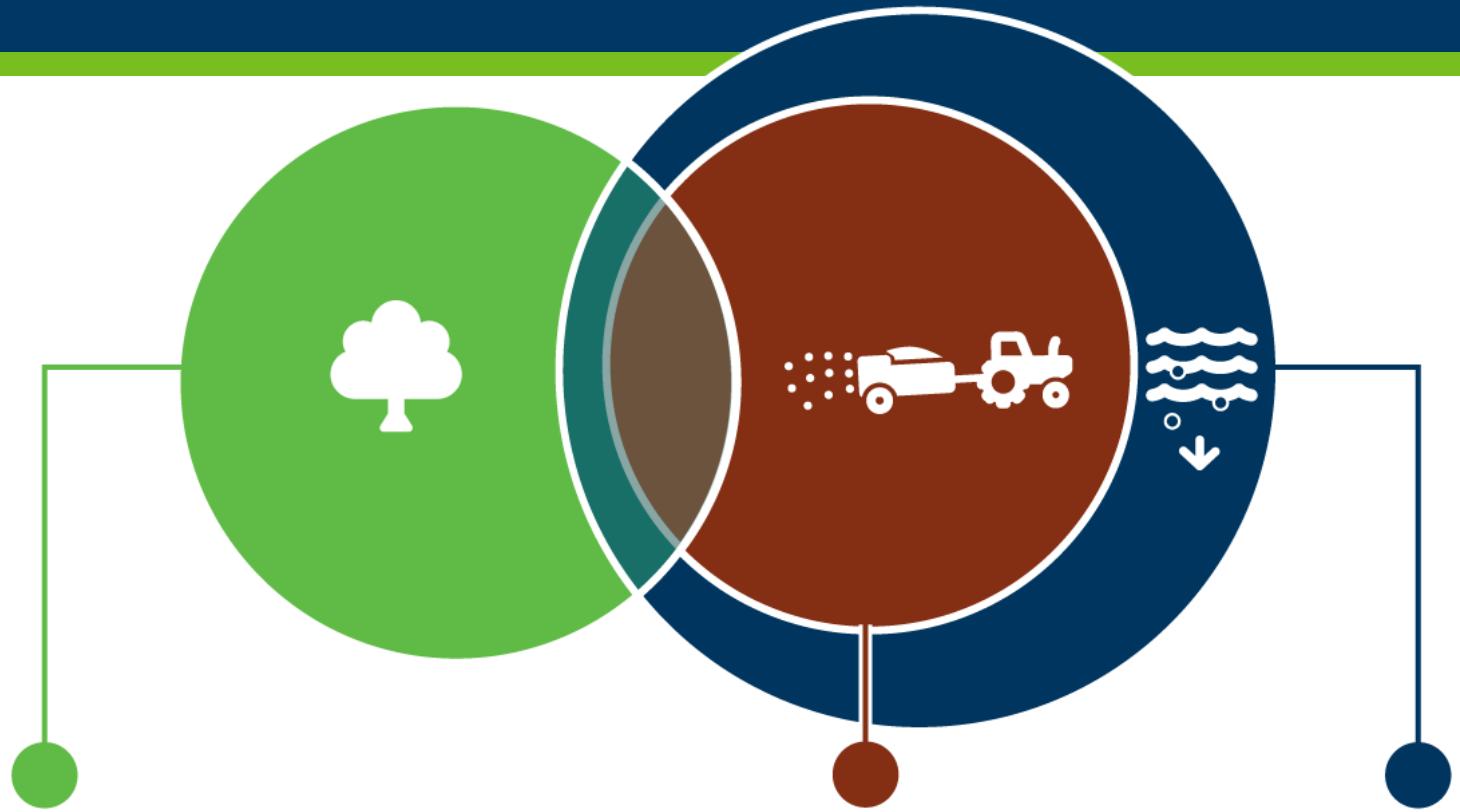
Fully implement the nitrate drinking water standard

- Beginning April 2024
  - Nitrogen management plans
  - Consider N limits for facility upgrades and new discharges
  - Initiate rulemaking to protect aquatic life and set state discharge restrictions

Phase III timeline

Key Activities	Jan-Mar 2024	Apr-Jun 2024	Jul-Sept 2024	Oct-Dec 2024	Jan-Mar 2025	Apr-Jun 2025	Jul-Sept 2025	Oct-Dec 2025	2026 and beyond
Nutrient Reduction Strategy update	X	X	X	X	X	X	X		
Feedlot permit reissuance	X	X	X	X					
Feedlot rule revision			X	X	X	X	X	X	X
Wastewater nitrogen reduction implementation	X	X	X	X	X	X	X	X	X

Accelerating progress



Climate Action Framework

- Resilient landscapes
- Reduce emissions
- Store carbon

Agricultural BMPs

- Soil health, living cover
- Water storage
- Fertilizer efficiency

Nutrient Reduction Strategy

- Reduction goals
- Effective strategies
- Minnesota waters and downstream

Thank you!

MINNESOTA POLLUTION CONTROL AGENCY