



PFAS, Nitrate, and What's Next?

Managing Risks from Environmental Exposures

Tannie Eshenaur | Manager, Water Policy Center
Sam Hageman | Initiatives and Communications Coordinator, Site Assessment and Consultation Unit
Frieda von Qualen | Planning Director, Water Policy Center
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- Setting the scene: environmental health policy, systems, and sociocultural change
- Drinking water
 - Minnesota's 10-year action plan to ensure safe and sufficient drinking water for everyone, everywhere
 - Supporting Minnesota's 1.1 million private well users due to fewer existing safeguards; example of nitrate in southeast Minnesota
- PFAS and products
- Discussion



Policy, Systems, and Sociocultural Change

Tannie Eshenaur, MPH | Manager, Water Policy Center

Environmental Public Health

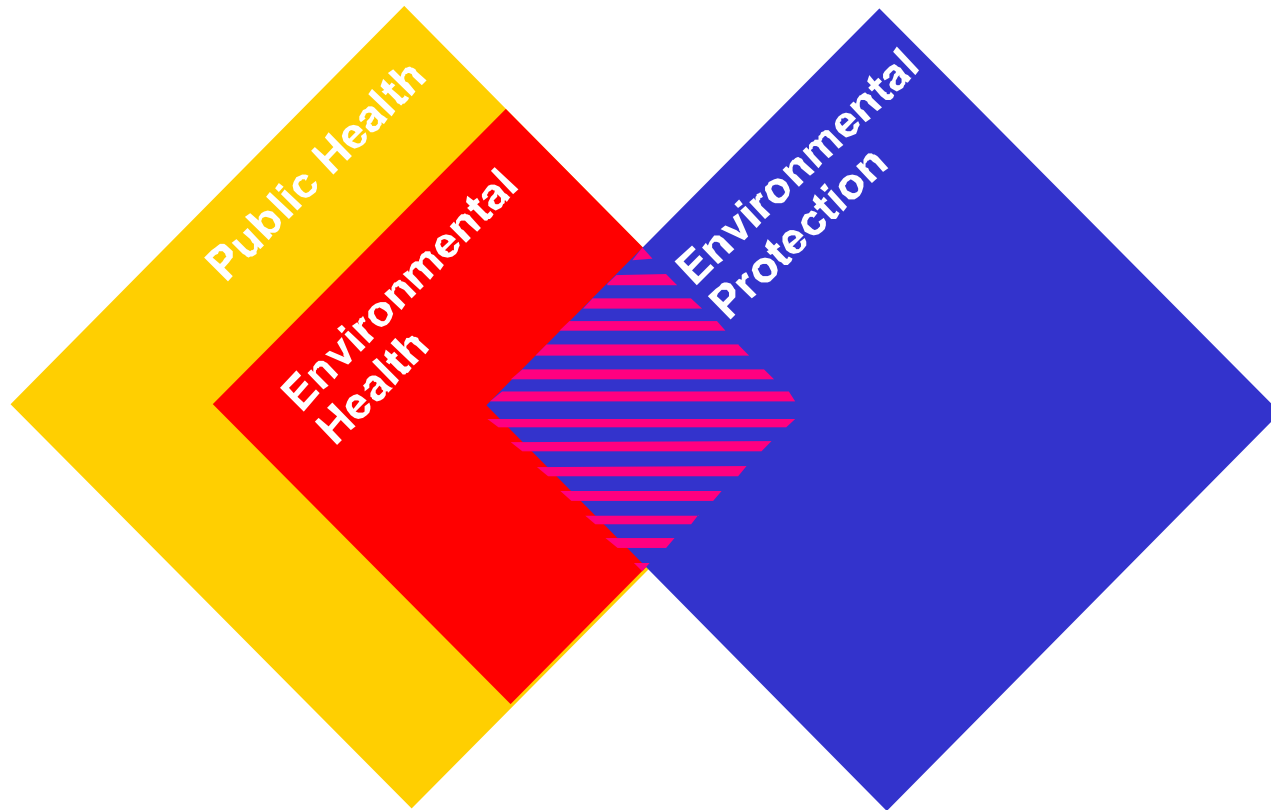


Diagram courtesy of Australia's EnHealth.

Ensure
physical
environmental
conditions in
which
communities
can be
healthy

No matter who or where you are in Minnesota



MDH Environmental Health Division works behind the scenes to create conditions that support the health of all Minnesotans.



Air



Homes & Lodging



Chemicals & Hazards



Water



Licenses & Registrations



Radiation



Food



Communities



Recreation



Weather & Climate

The MDH Mission - Protecting, maintaining, and improving the health of all Minnesotans.

Foundational Public Health Services

Foundational Areas



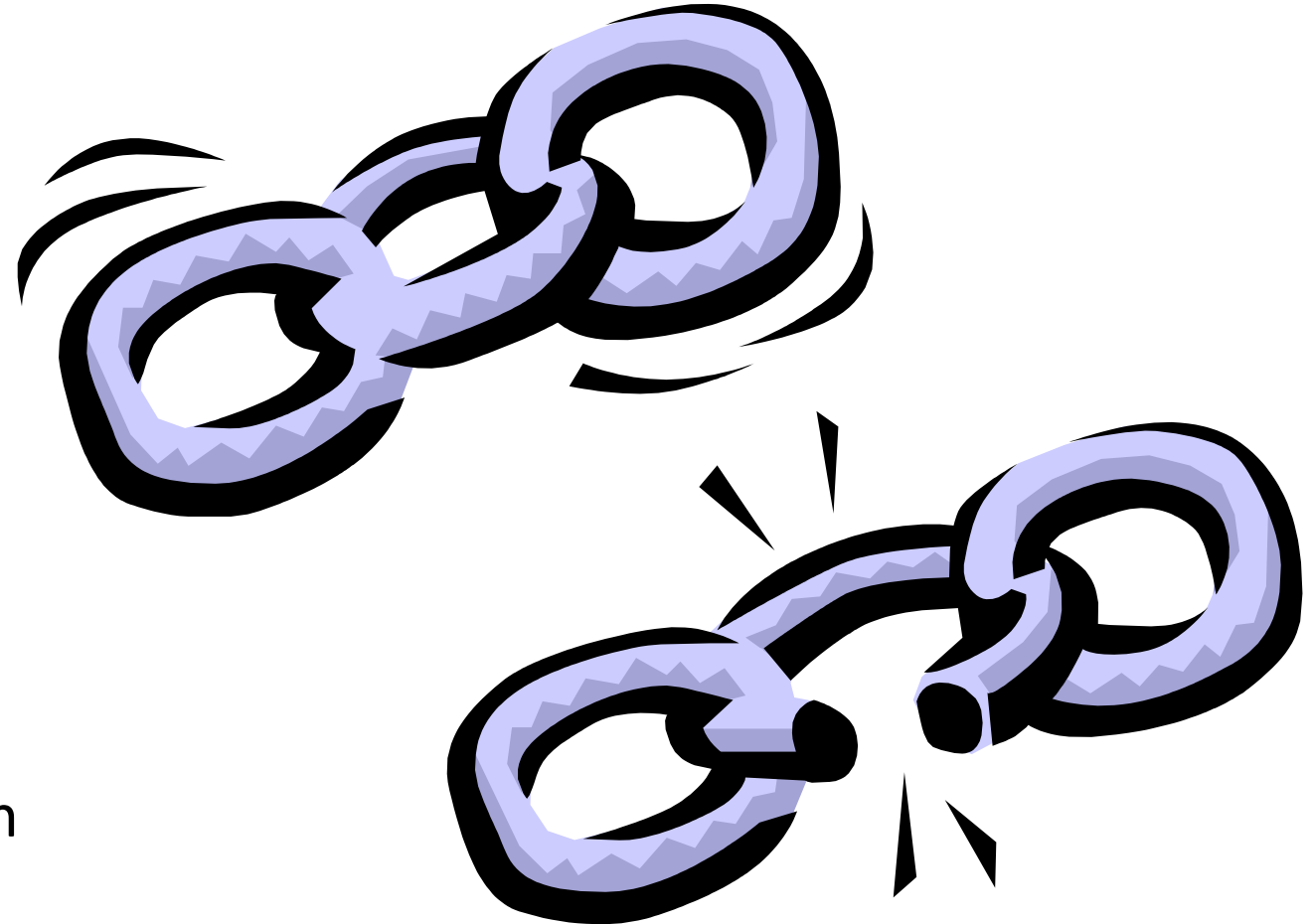
Risk
Assessment

Risk
Management

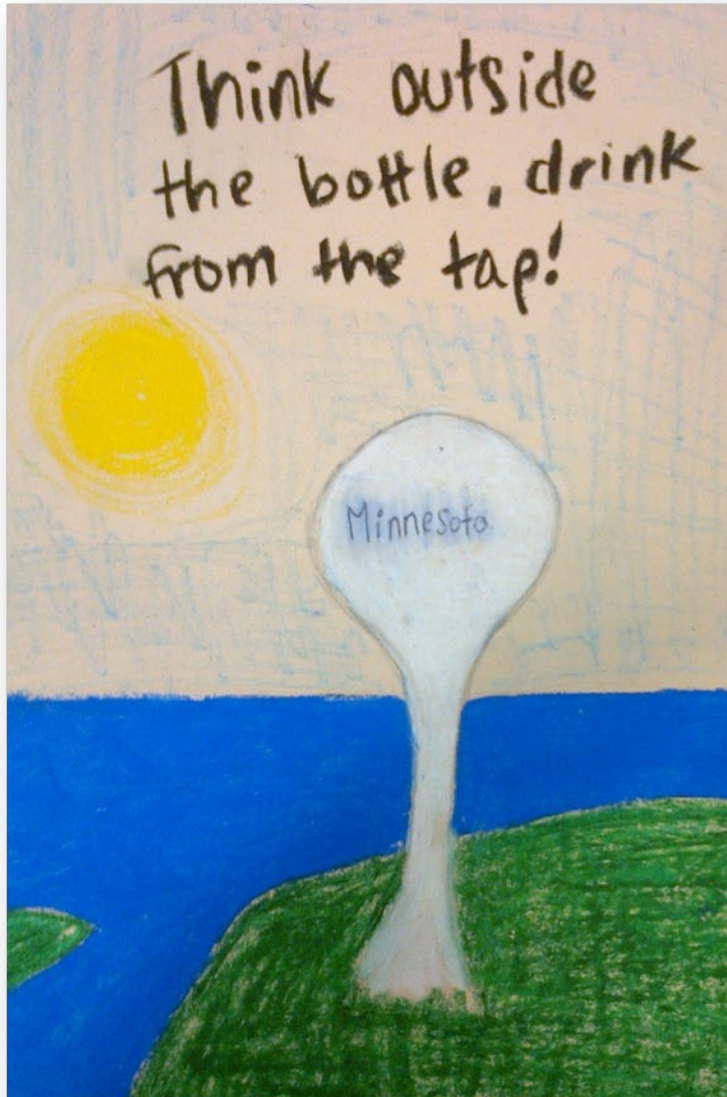
Risk Communication

Exposure Pathway

- Source of Exposure
- Fate and Transport (media)
- Exposure Point
- Exposure Route
 - Ingestion
 - Inhalation
 - Dermal absorption
- Potentially Exposed Population



RISKS: Health Outcomes for Minnesota



- Prevent:
 - disease from water-borne pathogens
 - health effects from naturally occurring contaminants
 - health effects from pollutants
 - dental caries and fluorosis
- Support economic development

VISION: Safe drinking water for everyone, everywhere in Minnesota

- Ensure safe, sufficient, and equitable drinking water
- Everywhere in Minnesota
- Now, and in the future
- Through a series of strategic safeguards
- From source to tap





DRINKING WATER PROTECTION FROM SOURCE TO TAP

MDH AND COMMUNITY WATER SYSTEM STAFF PROTECT DRINKING WATER AT EVERY STAGE

Surface Water Source



THREATS:

- Man-made: Examples include industrial chemicals, nitrate, pesticides, personal care products
- Natural: Examples include arsenic, bacteria, radium

PROTECTION:

- Protection of drinking water sources
- Inspections & investigations

Treatment



PROTECTION:

- Treatment & disinfection
- Construction plan review
- Inspections & investigations
- Monitoring & testing

TREATMENT MAY INCLUDE:

- Removing particles
- Disinfecting to protect from bacteria & viruses
- Adding fluoride to protect teeth

Storage



Distribution System

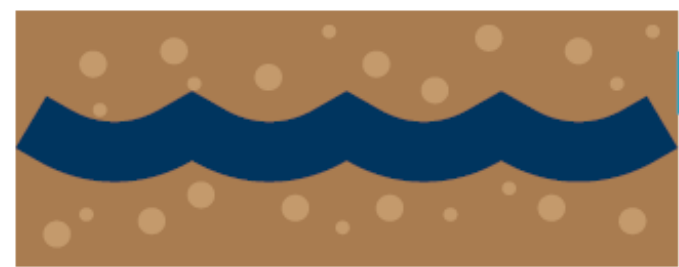
THREATS:

- Lead and copper
- Bacteria
- Disinfection byproducts
- Aging infrastructure (e.g. water main breaks)

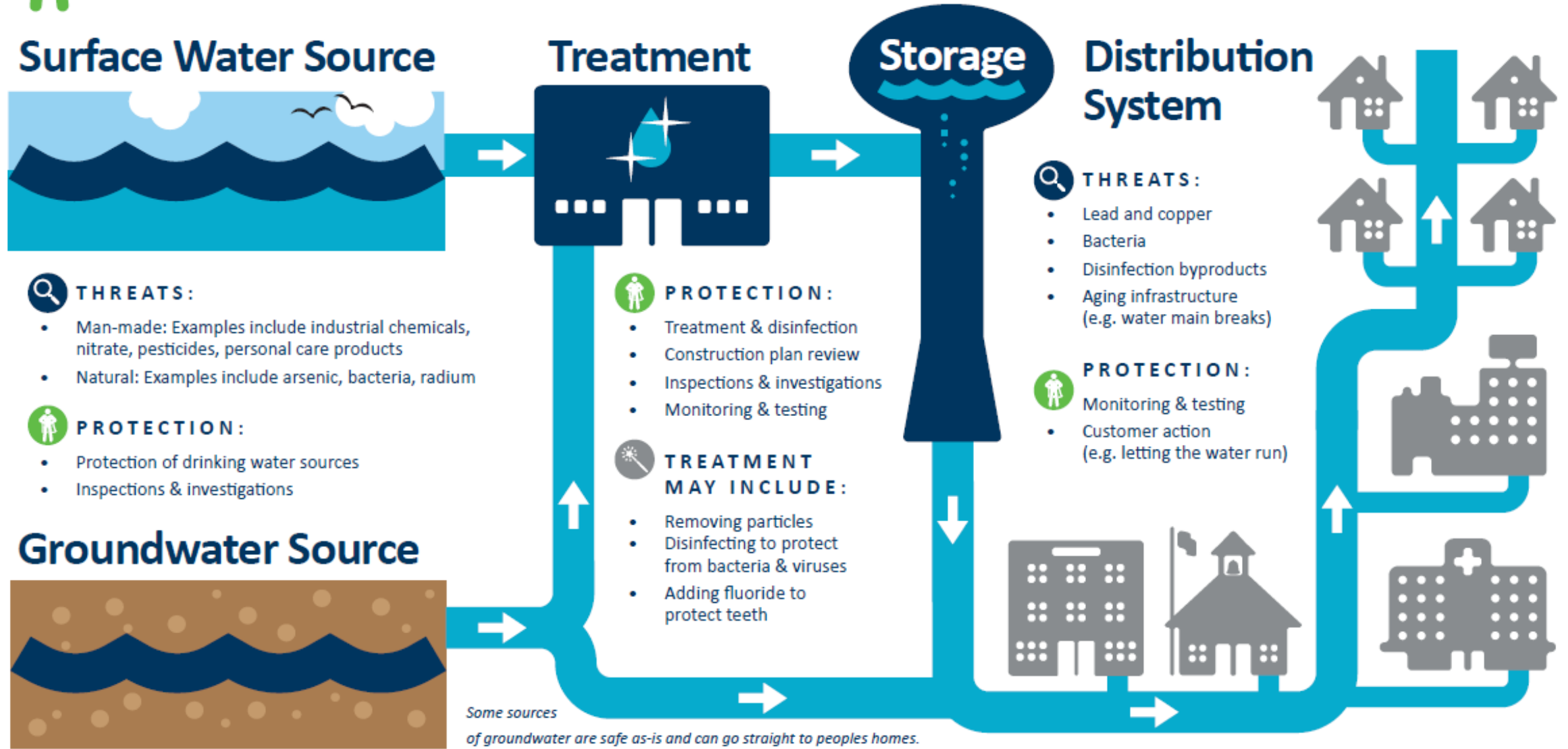
PROTECTION:

- Monitoring & testing
- Customer action (e.g. letting the water run)

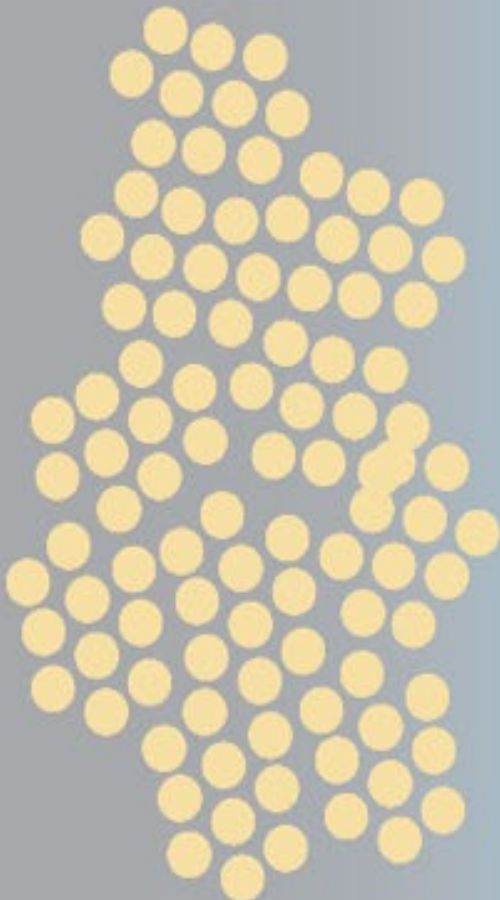
Groundwater Source



Some sources of groundwater are safe as-is and can go straight to peoples homes.

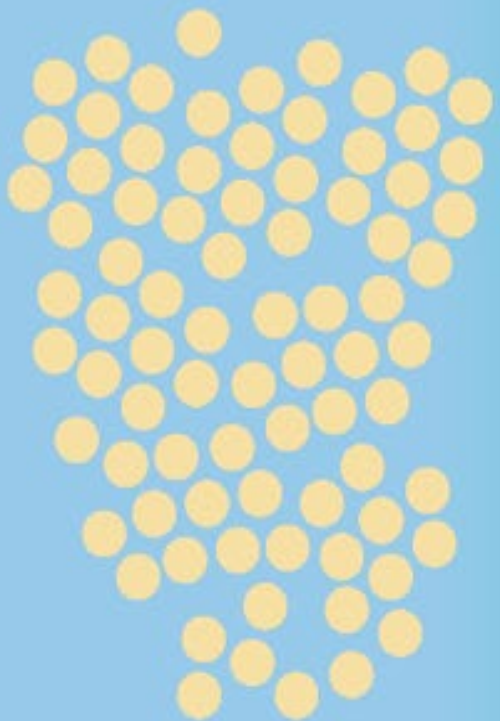


Future Surveillance



Surveillance

- Comparison Values
- Risk Assessment Advice
- Rapid Assessments
- Other state values



CEC Framework

- Advisory Levels
- Health Risk Limits
- Health-Based Values
- Health Risk Indices
- EPA HALs



Safe Drinking Water Act

- Maximum Contaminant Levels
- Treatment Techniques



Safe Drinking Water Act and public health principles















Opportunity: MN's Water Resource Management Framework



- ✓ Dramatic progress for source water protection
- ✓ Drinking water among top resource concerns in every watershed
- ✓ Increasing integration of drinking water partners
- ? Limits of conservation model
 - Lack of groundwater monitoring data
 - Surface water strategies dominate
 - No clear pathway:
 - Private well testing and treatment
 - Geogenic contaminants

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 	

Will We Have Safe Drinking Water in 2034? Minnesota's Drinking Water Action Plan

Frieda von Qualen, MDP | Planning Director
Water Policy Center

“...develop public health policies and an action plan to address threats to safe drinking water, including development of a statewide plan for protecting drinking water based on recommendations from the *Future of Drinking Water* report”

2021 Minnesota Session Law Chapter 1, Article 1, Section 7 (d)



Minnesota Drinking Water Action Plan

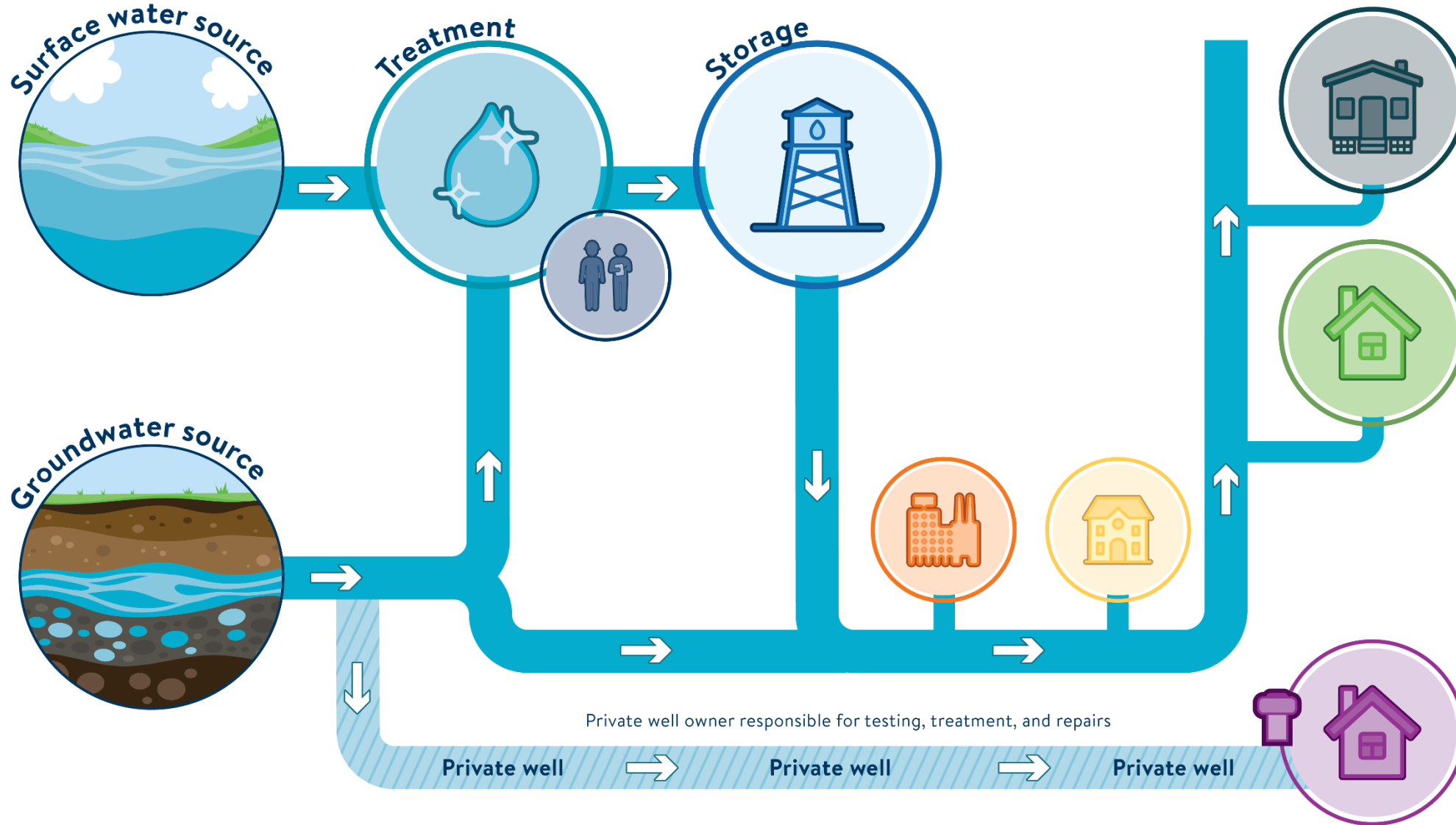
An actionable 10-year plan to ensure that everyone, everywhere in Minnesota has equitable access to safe and sufficient drinking water.

Serve every Minnesotan.

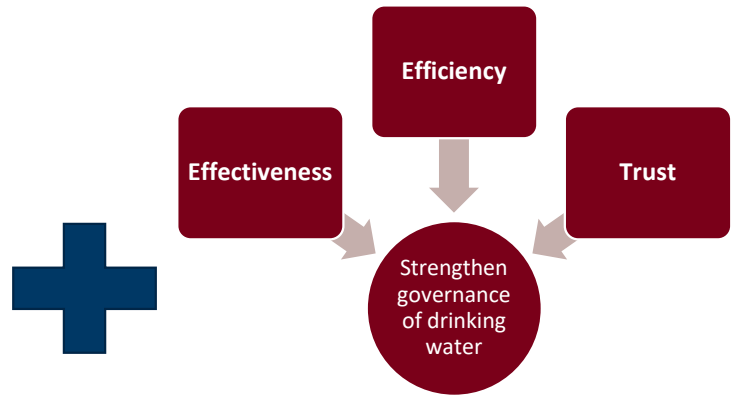
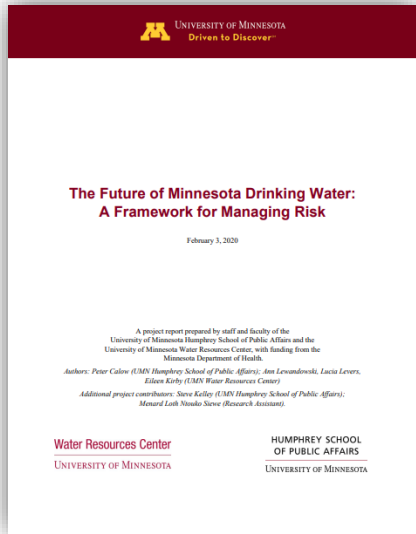
Be the State's commitment to protect against existing and emerging threats.

Incorporates expertise and robust feedback from diverse perspectives.

Protecting drinking water from source to tap



Ingredients for developing the Plan



Independent Governance Assessment



Subject Matter Expertise



People who drink water





Completed Meetings



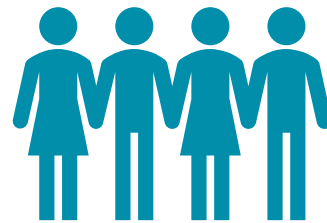
Read the full report

Community meetings

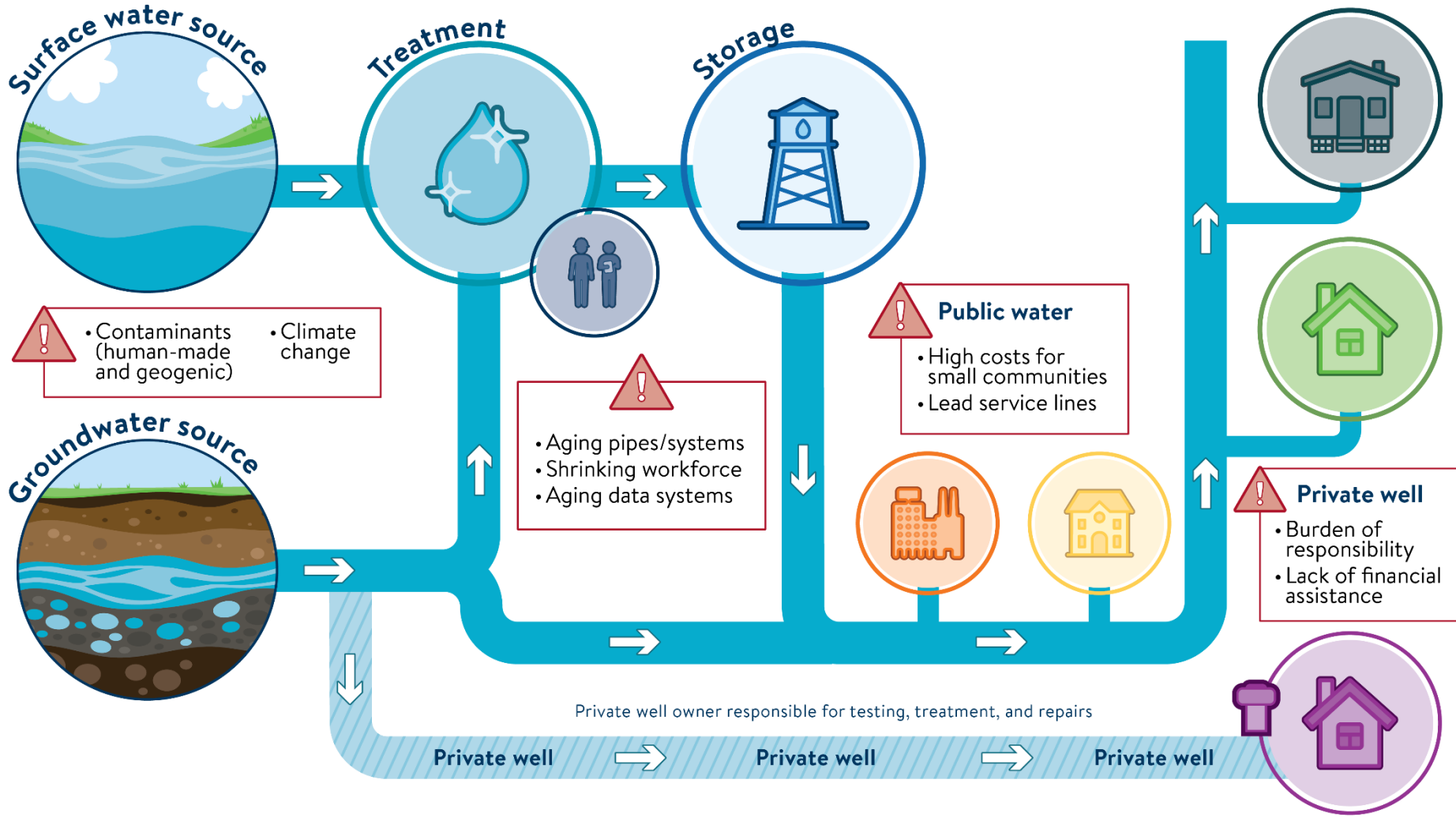
66%

Support developing **new state drinking water standards.**

Most trust their tap water, but 20% distrust their water quality.







Culturally sensitive **community engagement is crucial** for understanding Minnesotans' experiences with drinking water.



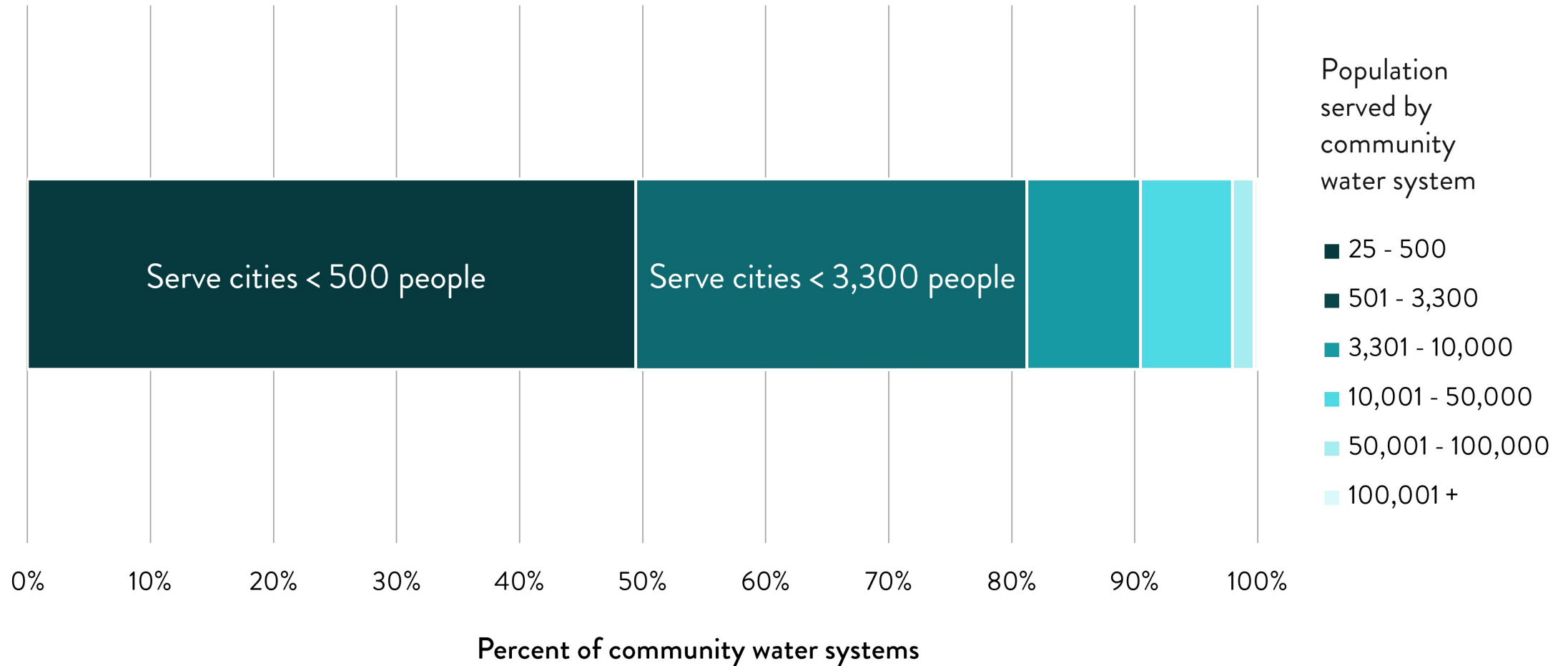
Protecting drinking water from source to tap

1.1 million private well users have fewer safeguards.

	Construction	Routine testing	Mitigation to address contaminants	Protecting source waters	Funding for construction, treatment, repairs, sealing	Well sealing
Public Water System	✓	✓	✓	✓	✓	✓
Private Well	✓	 Initial test at well construction			 Some selective loans	✓

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

Small community water systems face disproportionate burdens in addressing contaminants.



A disconnect in risk perception, public health burden, and resource investment

~12%

~144,000 private well users have **arsenic** above 10 µg/L

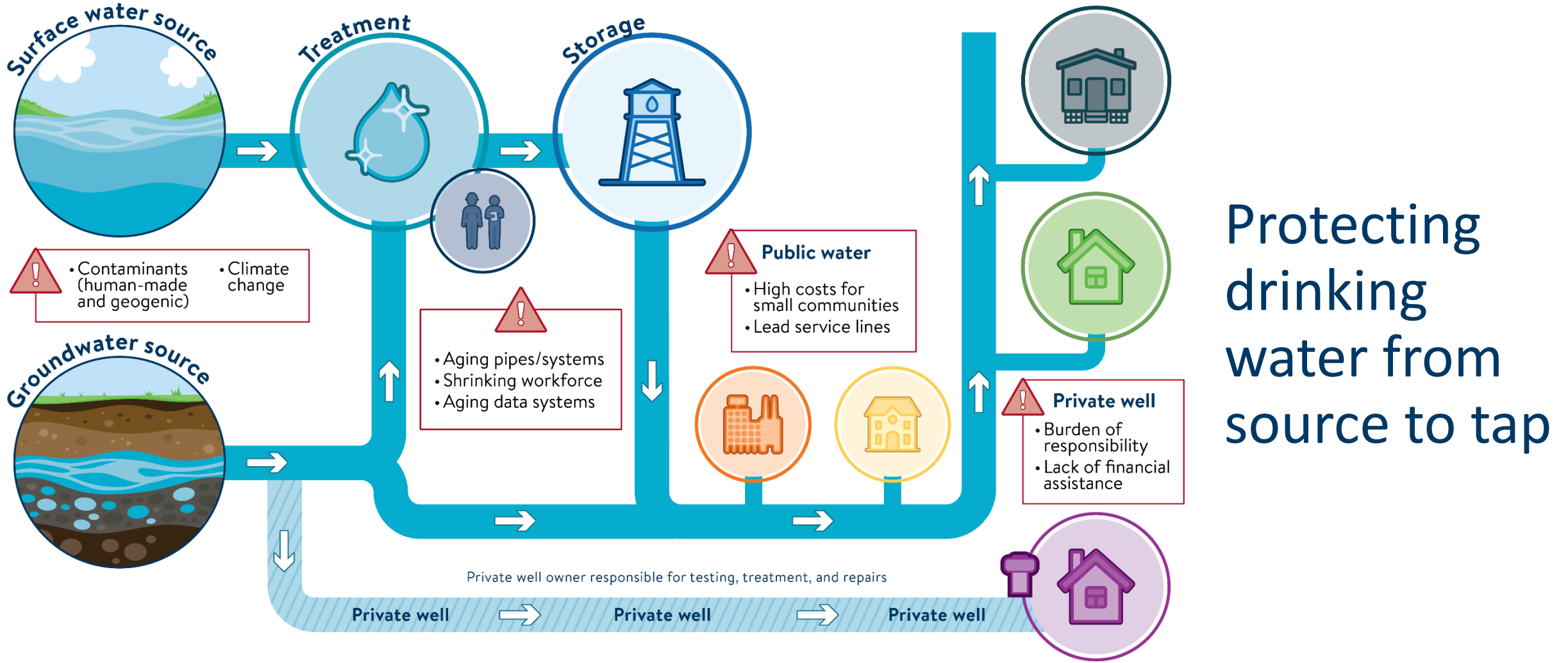
- Carcinogen across all ages
- Health effects below public drinking water standard



~5%

~60,000 private well users have **nitrate** above 10 mg/L

- Infants < 1 yr fed water or formula made with water
- Other age impacts uncertain



Protecting drinking water from source to tap

Protect sources of drinking water	Establish resilient drinking water infrastructure (pumps, people, data)	Ensure safe tap water (public water & private wells)	Anticipate and manage emerging risks
Engage partners			

Goals and strategies

Protect sources of drinking water

- Identify and manage potential threats around drinking water source for public water systems and private wells.
- Include drinking water considerations in land use planning and zoning decisions.
- Emphasize source water protection in watershed management plans.
- Ensure adequate supply of water for public water systems and private wells.
- Ensure laws, rules and ordinances adequately protect sources of drinking water.

11/18/2024

Establish resilient drinking water infrastructure

- **Support communities with asset management and resiliency planning for drinking water infrastructure.**
- Support and grow the public water system and well contractor workforces.
- Transition from legacy data systems to modern resilient systems.

Ensure safe tap water

- Prevent and resolve health-based violations in public water systems and private wells.
- Reduce lead in drinking water.
- **Establish equitable access to private well testing and remediation.**
- Empower Minnesotans to value drinking water and take actions to sustain and protect it.

Anticipate and manage emerging risks

- Monitor drinking water sources for emerging contaminants and pathogens.
- Understand how humans may be affected by unregulated contaminants and emerging risks.
- **Prioritize emerging risks that present the largest public health burden in the context of all contaminants.**
- Advance laboratory capacity and methods to analyze for emerging risks.
- Address drinking water risks related to climate change.

Engage partners

- Communicate with and support the regulated community.
- Provide partners and residents with data on risks and challenges to safe drinking water.
- Facilitate outreach and education to communities affected by drinking water contamination.
- Leverage advisory councils to understand and prioritize challenges to safe drinking water.
- Create more public facing (residents) explanations of the drinking water supply system.
- Elevate drinking water concerns to elected officials.

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- **Community Partnership Development**

- Water utilities
- Water testing laboratories
- Soil and Water Conservation Districts
- Nonprofits

- **Policy Development and Support**

- Local ordinances for private well testing at property transfer and in rental properties
- Voice support for addressing contaminants in drinking water

- **Communications**

- Encourage private well testing and reading water quality reports
- Encourage a water ethic

What you can do

Take a look at the DRAFT



Future of Drinking Water

www.health.state.mn.us/communities/environment/water/cwf/fdw

Thank you!

Frieda von Qualen

Minnesota Department of Health

Water Policy Center

651-201-4547

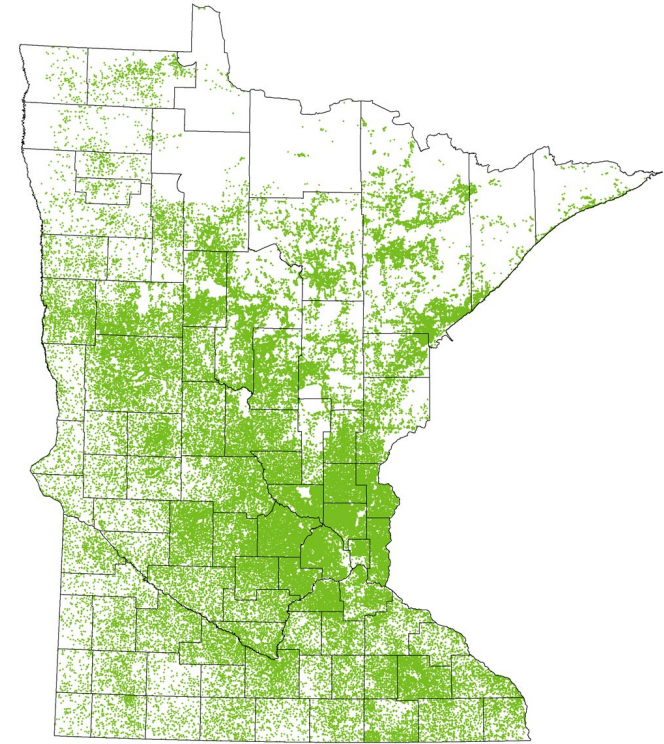
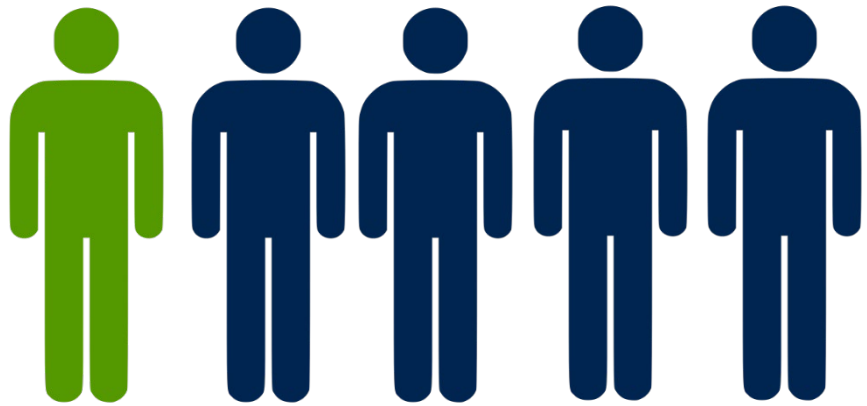
Frieda.vonqualen@state.mn.us



Nitrate in Private Wells: Minnesota's Response

Department of Agriculture
Department of Health
Pollution Control Agency

1.1 Million Private Well Users



About 1 in 5 Minnesotans get their drinking water from a private well.

Background

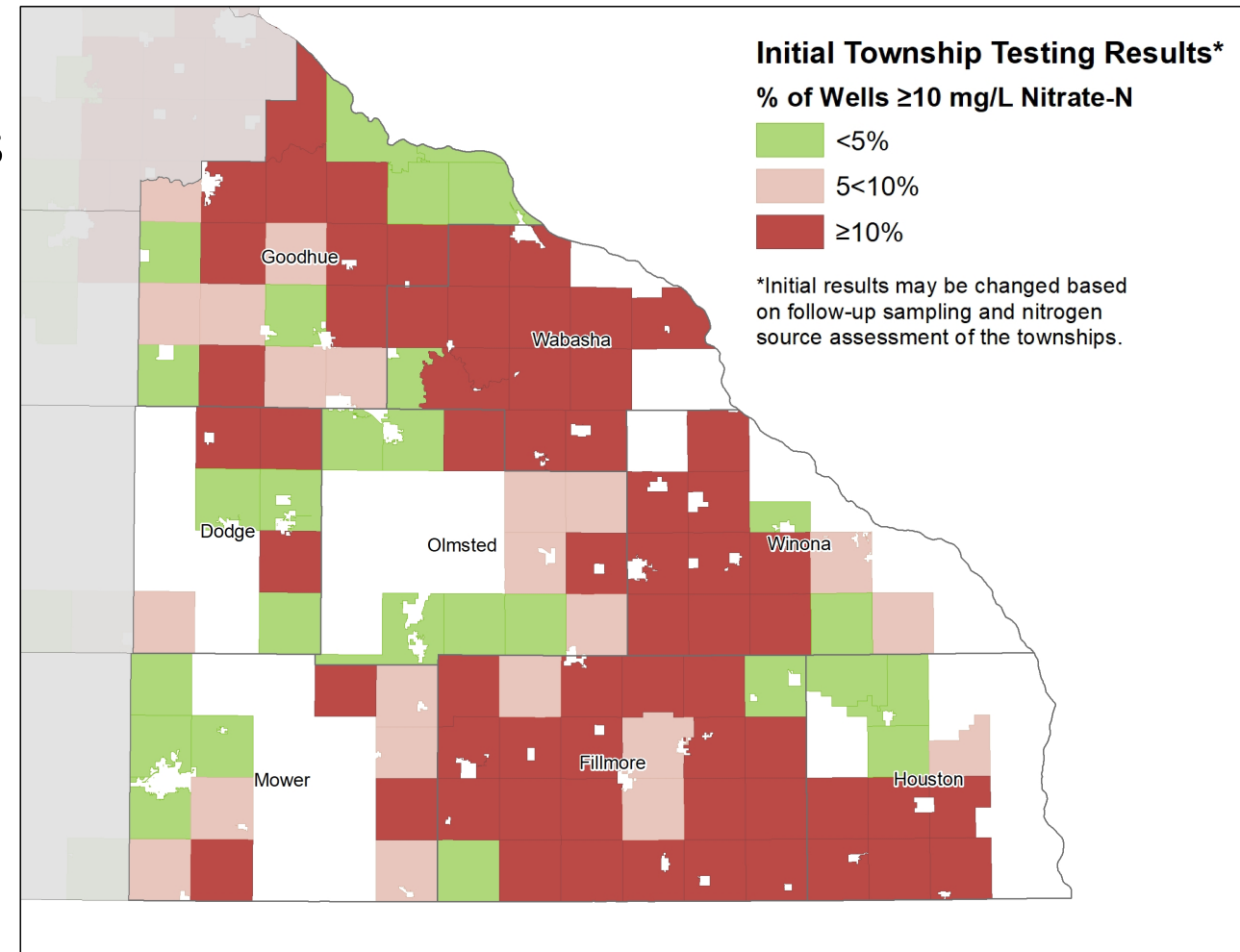
- On November 3, 2023, the U.S. Environmental Protection Agency (EPA) requested the Minnesota Department of Health (MDH), Minnesota Pollution Control Agency, and Minnesota Department of Agriculture **develop a coordinated and comprehensive work plan to reduce nitrate contamination of drinking water aquifers 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](#)



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



Overview of Nitrate Contamination in SE Minnesota

Protect your health!

Test your well water for:



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

Nitrate

- Decades in the making
- Inputs: fertilizer, manure, septics, etc.
- Acute risk for human health
- Bottle-fed infants and pregnant women
- Can affect how blood carries oxygen
- Indicates there is a pathway for other contaminants

Immediate Response

January – June 2024 led by MDH

Outreach

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

Use current data to select wells:

- MDA Township Testing
- MDH post-construction water sample
- SE MN Water Analysis Lab

Provide alternate water:

- Exploring options, experiences from agencies and local partners



Public Health Response

July 2024 - Forward led by MDH and MDA

- Work with partners
- Prioritize those most vulnerable populations
- Provide testing & mitigation options
- Design the approach so it can be used throughout MN



What you can do now

- Encourage private well users to test
- Remind public water system users their water is safe
- Connect with local partners (SWCD's, etc) and MDH
- Order free private well brochures to share
- Link to MDH webpages
- Refer questions to health.privatewells@state.mn.us



TAP IN



Order brochures

Thank you!

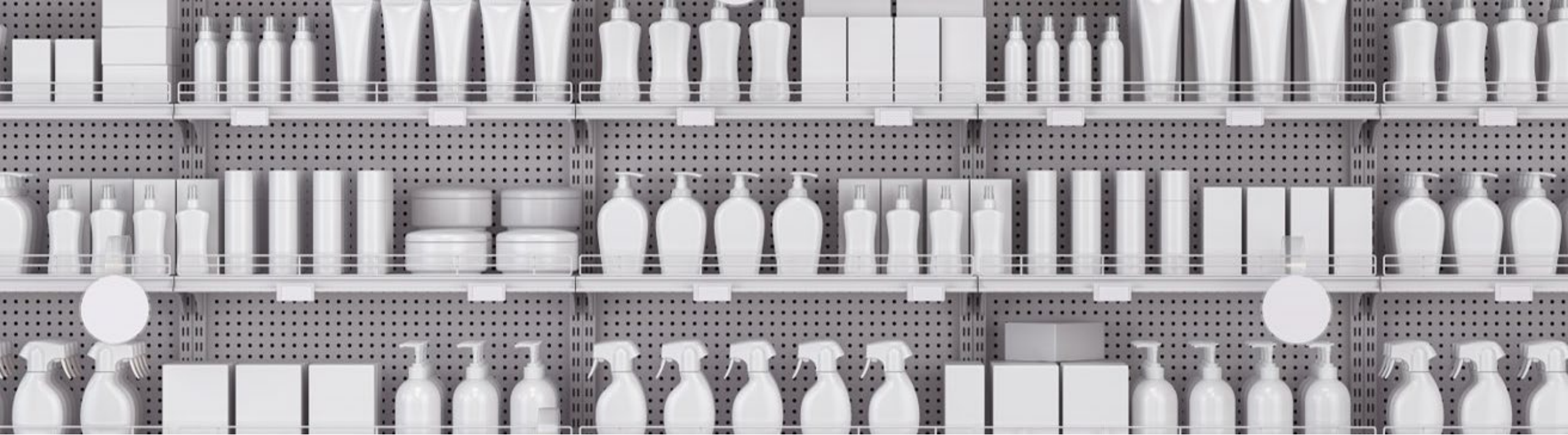
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PFAS and Products

Samantha Hageman | Strategic Initiatives & Communications Coordinator

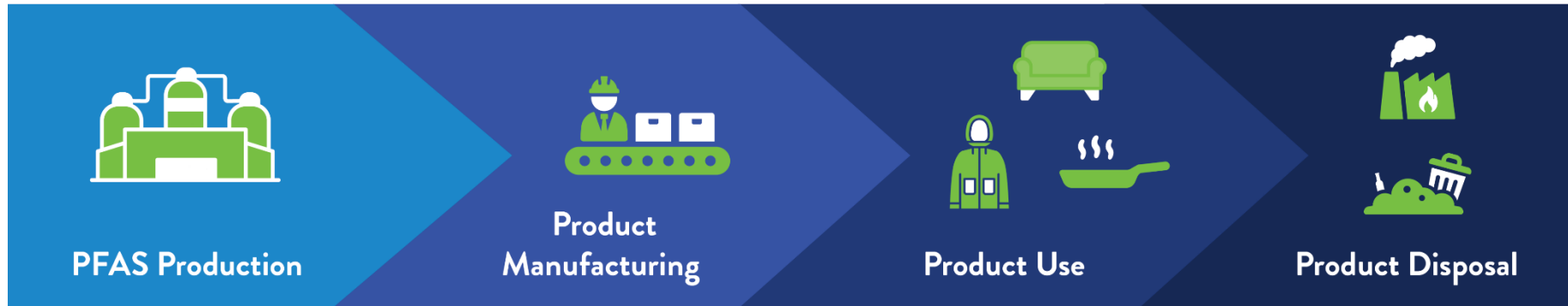
Per-and-Polyfluoroalkyl Substances (PFAS)

- Family of human-made chemicals
- Widely used in consumer products since the 1950's
- Commonly used for stain, water- and grease-resistant properties
- Known to build up in the body of humans and animals
- Risk of PFAS exposure and pollution whenever a product containing PFAS is made, used, or disposed of



[Per- and Polyfluoroalkyl Substances \(PFAS\) - MN Dept. of Health](#)

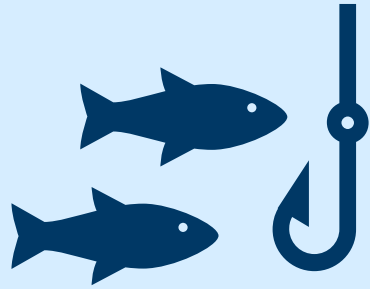
Where PFAS Come From



Where PFAS are Found

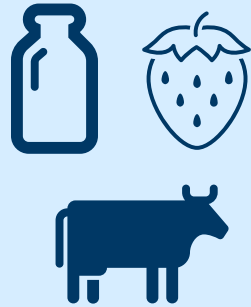


Human Exposure



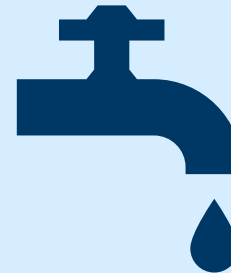
**Fish caught from
contaminated
water**

[Fish Consumption Guidance -
MN Dept. of Health](#)



**Food grown/raised
near contamination**

[PFAS and Homegrown Garden Produce](#)
[PFAS and Home-Raised Farm Animals](#)



**Contaminated
drinking water**

[PFAS in Drinking Water](#)



Consumer products

[PFAS and Products - MN Dept.
of Health](#)

Health Concerns

- Bioaccumulates in humans and animals
- Most sensitive: pregnant people, fetuses, infants, and children
- Impacts on human health:
 - Immune suppression
 - Liver function & high cholesterol
 - Thyroid function
 - Low birth weight
 - Kidney cancer
- Goal – Reduce exposure!

[PFAS and Health - MN Dept. of Health](#)





Minnesota
PFAS Blueprint

Minnesota
Takes Action

PFAS Use
Prohibitions



Reducing “forever chemicals” in Minnesota

Start dates of PFAS prohibitions by product category

2024

2025

2032



What You Can Do: Assessment & Surveillance

- Stay informed
 - Statewide
 - Community
- Additional resources
 - [Investigating Environmental Contaminants - MN supplement](#)
 - [Per- and Polyfluoroalkyl Substances \(PFAS\) - MN Dept. of Health](#)



What You Can Do: Communications

- Utilize risk communications tools & tactics
 - [Drinking Water Risk Communication Toolkit About Risk Communication - MN Dept. of Health](#)
- Keep your community & partners in the loop!
- Share PFAS resources with staff
- MPCA Amara's Law Communications Toolkit
 - [Communications Toolkit: PFAS reduction and Amara's Law | Minnesota Pollution Control Agency](#)



What You Can Do: Partnership Development

- Build & maintain community partnerships
- Utilize state partnerships
 - Minnesota Department of Health
 - [Per- and Polyfluoroalkyl Substances \(PFAS\) - MN Dept. of Health](#)
 - Minnesota Pollution Control Agency
 - [PFAS in Minnesota | Minnesota Pollution Control Agency](#)
 - Minnesota Department of Agriculture
 - [PFAS and Agriculture in Minnesota | Minnesota Department of Agriculture](#)
 - Minnesota Department of Natural Resources



Thank you!

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Clarification or follow-up questions

Discuss with people nearby

1. Does your organization work in any of the spaces discussed today?
2. What foundational capabilities do you use, or do you need when working in environmental health?
3. What new ideas could you take back to your organization based on today's presentations?
4. How can MDH support you in related work?

Plan to share a few ideas with the group