DRAFT: Minnesota State Drinking Water Action Plan

VERSION FOR SURVEY PURPOSES ONLY

01/04/2024

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Introduction

In 2021 the Clean Water Council and the Minnesota Legislature charged Minnesota Department of Health to "…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)). This draft of the Minnesota Drinking Water Action Plan is in response to that charge. The Plan is designed to be an actionable 10-year plan to ensure that everyone, everywhere in Minnesota has equitable access to safe and sufficient drinking water. It is intended to serve every Minnesotan, regardless of their drinking water source or where they live. It will serve as the State's commitment to protect against existing and emerging threats to drinking water.

We are developing the plan through an iterative process with multiple rounds of input from water professionals and people who drink water. As such, the current draft is just that—a draft. We know there will be substantial updates to the Plan as we incorporate reviewers' comments and partners' perspectives and priorities. The Plan draws upon concepts and recommendations from several sources, including the State Water Plan: Water and Climate (EQB, 2020) and the Clean Water Council's Strategic Plan (CWC, 2020).

Additionally, to help inform the Plan, the University of Minnesota Humphrey School of Public Affairs and Water Resources Center worked with Freshwater to conduct an assessment of drinking water governance in Minnesota. The governance assessment is complete; however, the current draft of the Drinking Water Action Plan does not fully address all the governance assessment findings and recommendations. The next version of the Plan will more fully incorporate and respond to those findings. As you review the Plan contents, please keep in mind this is a draft plan and we need your perspective to help ensure safe and sufficient drinking water for everyone in Minnesota.

Minnesota's Drinking Water System

Context

Safe, reliable, and affordable drinking water is essential for the health of all Minnesotans and our economy. Countless activities are necessary to protect drinking water, including protecting source water, educating consumers, training, certifying and supporting water operators and well contractors, inspecting and assisting public water systems, testing water, addressing threats, and funding improvement projects. The Minnesota Department of Health (MDH) is responsible for protecting drinking water at the almost 7,000 public water systems across the state, and for ensuring proper construction and sealing of public and private wells. MDH also works to improve, educate about, and enforce rules that protect and restore groundwater and source water.

MDH began as the Minnesota State Board of Health in 1872, largely as a result of waterborne and foodborne diseases. Typhoid fever, a waterborne disease, was taking a significant toll on

lives. Advances in improving drinking water quality were rapid; the results were dramatic. By the early 1900s, treatment and disinfection of drinking water resulted in the virtual elimination of waterborne diseases such as cholera, typhoid, dysentery, and hepatitis.

More than a century later the importance of safe and sufficient water remains as strong as ever, and the challenges toward achieving this goal emerge in new and different manners. The passage of the federal Safe Drinking Water Act in 1974 established a national program of regulations and standards covering all public water systems in the United States. Since 1974, the EPA has been responsible for regulating the nation's public water supply systems, under the federal Safe Drinking Water Act (SDWA). However, almost all states, including Minnesota, have assumed responsibility for enforcing the act within their own borders. Minnesota became one of the first states to achieve primacy, and to begin regulating public water supply systems at the state level, in 1976.

The Minnesota Well Code, established by statute in 1974, benefits both private well users and public water system customers by regulating the installation of drinking water wells and certifying well-drillers and system operators.

What kinds of drinking water systems serve Minnesotans

Public water systems in Minnesota are diverse, varying in size, treatment, and water source. When classifying drinking water systems, one initial question is "what is the source of the water?" As shown in Figure 1, the source for most Minnesotans is groundwater, drawn from subsurface aquifers. However, some of the largest public water systems in the state rely on surface water, drawn from the Mississippi River, Lake Superior, and a handful of smaller water bodies such as mine pits. Although surface water and groundwater are often hydrologically connected, they are managed differently – a topic we'll review later in this chapter.

Figure 1: In Minnesota public water suppliers get their water from a mix of surface and groundwater. Approximately 1.1 million private well users get their drinking water from groundwater.

Public Water Systems

The definition of "public water system" in the Safe Drinking Water Act is broad. To be considered "public," a water supply system must have its own

water source and provide water to 25 or more people or have 15 or more service connections. As of 2023, Minnesota has 6,589 public water systems as shown in Figure 2. The Minnesota Department of Health's Drinking Water Protection (DWP) program works with partners to ensure residents and visitors have safe drinking water where they live (community water systems) and where they learn, work, and play (noncommunity water systems).

- Of those systems, 969 are community systems, which provide water to people in their homes or places of residence. Community water systems serve over 4.5 million Minnesotans. Most of these community systems use groundwater from underground sources, tapped by wells, as their source of water. However, 23 of these systems, including the municipal systems that serve the state's largest cities, use surface water drawn from lakes or rivers.
- Of these community water systems, 731 are municipal systems, serving towns or cities. The rest of the community systems provide water to people in various residential locations, including manufactured home parks, apartment buildings, housing subdivisions, and correctional facilities.
- The rest of the state's 5,620 public water systems are noncommunity systems, also subdivided into two categories. "Transient noncommunity systems" provide water to an ever-changing "transient" population at places such as restaurants, resorts, and highway rest stops. Other noncommunity systems may provide water to relatively stable population groups in nonresidential locations such as schools, workplaces, and day-care facilities. These facilities are considered "non-transient" noncommunity systems.

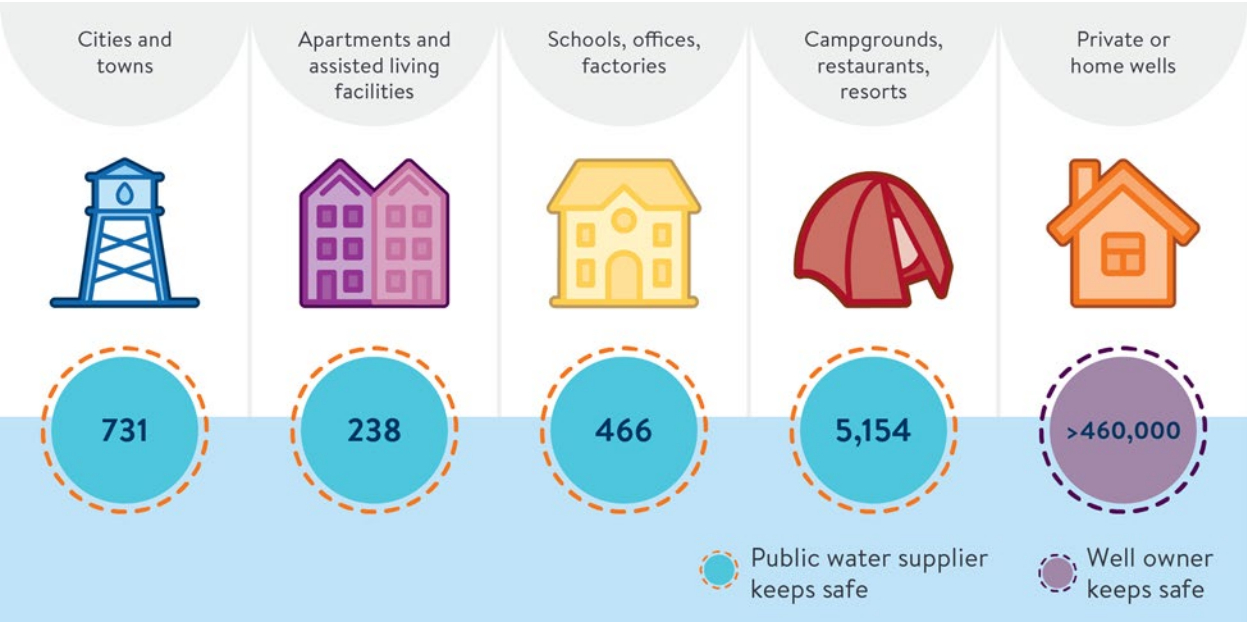

Figure 2: Number of Minnesota water supplies by category.

Private Drinking Water Systems

As shown in Figure 2, there are over 457,000 private wells in Minnesota providing drinking water to about one million people. (This figure does not include wells used for irrigation, groundwater monitoring or industrial purposes.)

While most private wells serve just one household, some serve small clusters of households that fall below the 25 people/15 service connection threshold for public water systems. The number of such multi-household wells is not known.

How Drinking Water is Managed and Governed

It's important to recognize that drinking water is managed as part of a larger system of water governance that stretches across multiple state and federal agencies and local governments. Starting with a summary of MDH's role, this section explores the interrelated authorities and responsibilities of state agencies, local governments, and partnering organizations to protect and ensure the supply, quality, and sustainability of drinking water.

Drinking Water System Management at MDH

Within the Department of Health, the Environmental Health Division is responsible for drinking water management and assessment. As noted above, the Drinking Water Protection (DWP) Section oversees public systems, while the Well Management Section (WMS) oversees the installation of public and private wells.

The MDH Well Management Section (WMS) works to protect both public health and groundwater by assuring the proper construction of new wells and borings – including both private wells and public water supply wells – and the proper sealing of unused wells and borings. WMS also works with well drillers and well owners to promote safe operation & maintenance. The Commissioner of Health has the authority to delegate specific responsibilities for the regulation of water wells to local boards of health. There are 10 boards of health that have responsibility for wells within their jurisdictions. See Delegated Well Programs (https://www.health.state.mn.us/communities/environment/water/wells/delegated.html).

The recently created Water Policy Center (WPC) has the broad mission of developing public health policies and plans to address threats to safe drinking water, including development of this Plan. The WPC is funded largely through the Clean Water Fund and works with other agencies, research institutions, and local units of government on water-related initiatives.

Other sections within the division and across the agency also play a variety of roles:

- The Environmental Surveillance and Assessment (ESA) Section develops guidance on potential health risks posed by drinking water contaminants, including development of Health Risk Limits (thresholds) and health-based guidance values for various contaminants and assessment of Chemicals of Emerging Concern (CECs).
- The Food, Pools, and Lodging Services (FPLS) Section and delegated local agencies license and inspect license and inspect food, beverage, lodging, manufactured home parks, recreational camping areas, swimming pools and youth camp establishments in Minnesota (including water supply inspections).

- The Minnesota Laboratory Accreditation Program accredits environmental laboratories to ensure laboratories submit reliable and consistent data to Minnesota's various environmental programs.
- The Public Health Laboratory analyzes water samples for contaminants and diseases and develops methods to analyze for emerging contaminants.
- The Waterborne Diseases Unit - part of the Infection Disease Epidemiology Prevention and Control Division, studies and investigates waterborne diseases in Minnesota.

Drinking Water Management Across State Agencies

As noted above, groundwater and surface water are managed under different but overlapping authorities.

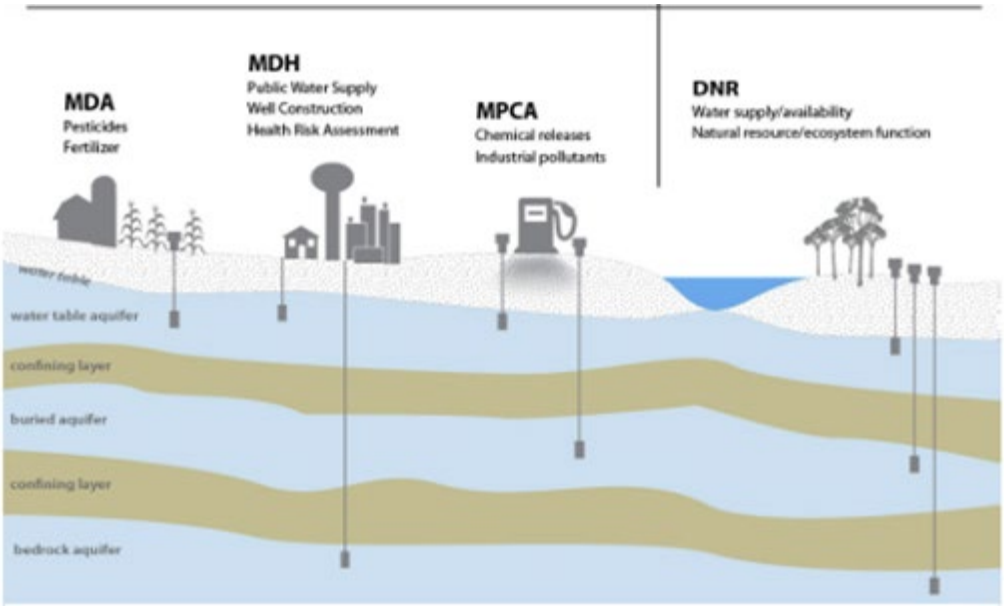

Figure 3: Minnesota has several state agencies that work with surface and groundwater.

Figure 3 provides a simplified overview of state agency roles in managing groundwater. In addition to MDH's roles, other agencies and government have distinct and legislatively mandated responsibilities for management of both ground and surface water, as summarized in Table 1:

Groundwater	**Surface Water**	**Inter-Agency Collaboration and Related Issues**
MN Department of Natural Resources (DNR)		
• Regulates groundwater withdrawals through a system of water appropriation permits. • Investigates well interferences.	• Monitors stream flow and surface – groundwater interactions • Implements state drought plan	• DNR now provides preliminary review of proposed wells through its water appropriation permitting system. (MDH is

Groundwater	Surface Water	Inter-Agency Collaboration and Related Issues
• Tracks water conservation data from permittees. • Operates a network of observation wells. • Partners with MN Geological Survey to prepare county geologic atlases for groundwater sustainability.	• Operates a network of stream gages • Monitors stream and lake ecology and ecosystem functions	notified after wells are constructed.)
MN Department of Agriculture (MDA)		
• Regulates the sale, use and disposal of pesticides and the use, storage management and licensing of fertilizers and soil/plant amendments. • Manages a statewide network of groundwater quality monitoring wells, primarily in agricultural areas, to assess potential pesticides and fertilizer impacts. • Administers the **Groundwater Protection Rule**, which restricts fall fertilizer application in areas with vulnerable groundwater or DWSMAs with high nitrate levels and can entail additional requirements for agricultural practices in those highly vulnerable DWSMAs.	• Manages Surface Water Pesticide Water Quality Monitoring program; identifies pesticide impairments; designates surface water pesticides of concern. • Manages Discovery Farms Network • Conducts and supports research on ag BMPs	
MN Pollution Control Agency (MPCA) - Under the federal Clean Water Act and state rules, MPCA establishes water quality standards for surface and groundwater, identifying seven "beneficial use classes." Class 1 includes all water used for domestic consumption. All groundwater is assigned Class 1 status.		
• Maintains a network of approximately 270 shallow monitoring wells located in non-agricultural areas overlying vulnerable aquifers. Analyzes wells for contaminants of emerging concern. • Maintains Groundwater Contamination Atlas in partnership with MDH and MDA.	• Coordinates Minnesota's watershed approach to water quality, which promotes increased collaboration and a common vision for planning and implementation activities. • Manages watershed monitoring and assessment, including Watershed Restoration and Protection Strategy (WRAPS) reports.	

<table>
<tr><th>Groundwater</th><th>Surface Water</th><th>Inter-Agency Collaboration and Related Issues</th></tr>
<tr><td colspan="3">Minnesota Public Facilities Authority (PFA) – a multi-agency authority that makes low-interest loans and grants available for public infrastructure projects. Member agencies include MDH, MPCA, MDA, MnDOT and DEED.</td></tr>
<tr><td>Drinking Water Revolving Fund: Administered jointly by the PFA and MDH, helps communities build drinking water storage, treatment and distribution systems that comply with standards in the Safe Drinking Water Act. Projects must be included on the MDH’s Project Priority List and the PFA's Intended Use Plan.
2023 legislative appropriation of $240M for replacement of lead service lines, leveraging additional federal funds under the IIJA. Water suppliers must complete an inventory of lead service lines by October 2024.</td><td>Other PFA grant and fund programs include:
Water Infrastructure Fund: provides matching grants for wastewater and drinking water projects to communities that meet affordability criteria and receive PFA loans or financing from USDA’s Rural Development Program.
Point Source Implementation Grants: Provides grants to local governments to assist with water infrastructure projects, primarily for wastewater treatment, but including some water treatment projects. Grants may be used to fund projects on MDH’s Project Priority List.</td><td></td></tr>
<tr><td colspan="3">Board of Water and Soil Resources – the state soil and water conservation agency, responsible for comprehensive local water management, easement and habitat programs, and the Wetland Conservation Act as it relates to private land. In relation to drinking water, BWSR:
Oversees the One Watershed, One Plan program, which can identify drinking water-related issues and provide locally-directed funds (Watershed-Based Implementation Funding) at a major watershed scale, depending on the outcome of the planning process.
Provides multiple competitive grants supported by the Clean Water Fund, including Projects and Practices and Wellhead Protection Partner Grants (see below)</td></tr>
<tr><td colspan="3">Clean Water Council – Created to advise the Legislature and the Governor on the implementation of the 2006 Clean Water Legacy Act and distribution of the Clean Water Fund under the Clean Water, Land and Legacy Amendment. The Council represents multiple interests and agencies, including all those listed above, as well as the Metropolitan Council, environmental, business and farm organizations, legislators and local and tribal governments. The Council’s 2020 Strategic Plan includes many drinking water-related goals and policies. See Clean Water Fund information below under Grant and Loan Programs.</td></tr>
</table>

Groundwater	Surface Water	Inter-Agency Collaboration and Related Issues
Metropolitan Council – As the regional planning agency for the Twin Cities metropolitan area, the Met Council is responsible for developing an overall regional approach to water planning and management, through surface water monitoring, wastewater management, and watershed and local water planning. The Met Council promotes integration of wastewater, water supply, and surface water management. Water supplies in the metro area include both surface water and groundwater resources.		

Tribal Governments' Roles in Drinking Water Management

The state of Minnesota is home to eleven federally recognized Indian Tribes with elected Tribal government officials. The State acknowledges and supports the unique status of the Minnesota Tribal Nations and their absolute right to existence, self-governance, and self-determination. The EPA is the regulatory authority for public water systems that are managed by the sovereign nations. MDH works with tribal nations to review drinking water protection plans but lacks the authority to approve these plans; EPA holds that authority. The Minnesota Well Code regulations do not apply to sovereign nations. MDH works with sovereign nations on well construction, maintenance, and sealing when support is requested.

Local/Regional Authorities and NGO Partners in Water Management

A broad range of local governments, advisory councils and regional authorities are important partners who play multiple roles in drinking water management, most directly as managers and operators of water supply systems, but also as watershed managers and planners, local public health officials and advocates.

- **Soil and Water Conservation Districts (SWCDs)** and **Watershed Districts (WDs)** and **Watershed Management Organizations** (WMOs) often play specific roles as the lead organizations for watershed-scale planning and as primary decision-makers on the use of state funds for activities such as well-sealing, described below under Grant and Loan Programs.
- **Community health boards (CHBs)** are the legal governing authorities for local public health activities across Minnesota, working to prevent diseases, protect against environmental health hazards, promote healthy behaviors and communities, and prioritize community health needs and services. CHB duties include monitoring air and water quality. As of 2023, there are 51 CHBs in Minnesota, serving single and multiple counties and cities. CHBs play varied roles in drinking water protection. Some CHBs help provide private well testing, have water testing laboratories, and help reach out to private well users.
- The **Advisory Council on Wells and Borings** is an 18-member body authorized by statute to advise MDH on technical matters related to the construction, repair and sealing of

wells and borings and the licensure of well and boring contractors. The Council's activities also include review of new products and technologies, codes and standards, and suggestions for improvements to department procedures.

A number of non-governmental organizations partner with and assist local water suppliers, well drillers and well owners.

- The **Minnesota Rural Water Association (MRWA)**, an affiliate of the National Rural Water Association, provides professional on-site assistance and trainings to water and wastewater system personnel. MRWA provides technical support for managerial, financial, and operation and maintenance issues, working closely with MDH, other state agencies, and the NRCS.
- The **Minnesota Well Owners Organization (MNWOO)** is a nonprofit organization for private well owners, focusing on education, technical and legal services, and advocacy to ensure the safety of those who use private wells for drinking water.
- The **Minnesota Water Well Association** is a nonprofit comprising water well drilling and pump contractors, geologists, hydrologists, groundwater industry suppliers, manufacturers, and other professionals.
- The **Source Water Protection Collaborative** brings together diverse public and private interests sector groups to advance collective action for protecting drinking water. The collaborative, founded in 2019, is convened by Environmental Initiative and supported by MDH. As of 2023, the Collaborative is exploring the connections between art, civic engagement, drinking water and environmental health, through a pilot project in Little Falls.

How Drinking Water is Regulated

Drinking water is regulated by the federal, state, and (to some extent) local governments. The primary federal authority for drinking water regulation comes from the Safe Drinking Water Act, with additional authorities based on the Clean Water Act.

Federal	**Federal Safe Drinking Water Act** (SDWA) *(US Code, Title 42, Chapter 6A, Subchapter XII)* National Primary Drinking Water Regulations and Implementation *(Title 40, Code of Federal Regulations, Parts 141 and Part 142)* • Established federal regulations for public water systems and standards for approximately 100 contaminants in drinking water. **Federal Clean Water Act** (CWA) *(US Code, Title 33, Chapter 26, Section 1251 et seq.)*

	• Designates beneficial uses for surface waters, numeric and narrative water quality standards, and antidegradation protections.
State	**Public Water System Regulations** • Statutory authority for the Minnesota Department of Health Drinking Water Protection Program *(Minnesota Statutes, chapter 144)* • Minnesota rules governing the public water systems *(Minnesota Rules, chapter 4720)* **Drinking Water Revolving Fund** • Statutory Authority for Drinking Water Revolving Fund *(Minnesota Statutes, chapter 446A.081)* • Minnesota rules governing Minnesota Department of Health's administration of the Drinking Water Revolving Fund *(Minnesota Rules, parts 4720.9000 to 4720.9080)* **Operator Certification** • Minnesota rules governing water supply systems and operator certifications *(Minnesota Statutes, sections 115.71 - 115.77)* • Minnesota rules regarding water treatment certification and classifications of systems and facilities *(Minnesota Rules, chapter 9400)* **Source Water Protection** • Statutory authority for Minnesota's Wellhead Protection Program (*Minnesota Statutes, chapter 103I section 103I.101, subdivision 5[8])* • Minnesota Wellhead Protection Program Requirements (*Minnesota Rules, chapter 4720, parts 4720.5100-5590*) • Minnesota Well Code governing the construction, maintenance, and sealing of wells *(Minnesota Rules, chapter 4725)* **Groundwater Protection and Health Risk Limits** • The 1989 Groundwater Protection Act gives MDH the authority to create Health Risk Limits (HRLs) *(Minnesota Statutes chapter 103H, section 103H.201)* https://www.revisor.mn.gov/statutes/cite/103H.201 • The 2001 Health Standards Statutes (144.0751) mandates that MDH include a reasonable margin of safety in creating HRLs to protect vulnerable subpopulations (infants, children, pregnant adults, etc.) *(Minnesota Statutes, section 144.0751)* **Surface Water Quality Standards** • Waters of the State *(Minnesota Rules, chapter 7050)* • Lake Superior Basin Water Standards *(Minnesota Rules, chapter 7052)*

How the Drinking Water System is Funded

State funding sources for drinking water protection include the annual Safe Drinking Water Fee assessed on service connections to municipally-owned community public water systems, the Clean Water Fund, and other state appropriations. Federal funding sources include the annual Public Water Supply Supervision (PWSS) Grant, Safe Drinking Water Revolving Fund (and its associated set-asides), and Water Infrastructure Improvements for the Nation (WIIN) Grants.

The Well Management Section collects fees for construction of wells and borings and for geothermal and other heat exchange devices, well maintenance and well sealing, variances, contractor licenses, and well disclosure certificates. Fees are credited to the state government special revenue fund.

Customers of public systems pay regular fees into the system through their water bills, which may be their most visible connection to their water systems. Water rates include the annual Safe Drinking Water Fee, also known as the service connection fee, used by MDH to cover required testing for over 100 drinking water contaminants. Water rates vary greatly across communities.

Grant and Loan Programs

Watershed Resources: Groundwater Restoration and Protection Strategies (GRAPS) reports are funded through the CWF to help prioritize local planning efforts to protect and restore groundwater resources. A GRAPS report identifies key groundwater quality and quantity concerns using existing data and information about groundwater and land-use practices in the watershed. The report also suggests targeted strategies to restore and protect groundwater. GRAPS reports complement the Watershed Restoration and Protection Strategies (WRAPS) reports prepared by the MN Pollution Control Agency that address surface water quality. Over 20 GRAPS reports have been completed since 2015. In 2021, MDH received funding from the Clean Water Fund to accelerate development of GRAPS to build capacity for groundwater project implementation. Since then, 16 Accelerated Implementation Grants have been awarded, with about $250,000 available annually. The program is anticipated to continue as long as the funding and demand are there.

Public supplies:

- The state Drinking Water Revolving Fund (DWRF) program provides below market rate loans to support approved drinking water infrastructure projects statewide, utilizing federal revolving loan funds. The fund is managed collaboratively effort by the Public Facilities Authority (PFA) and DWP.
- The Clean Water Fund (CWF) offers Source Water Protection Grants, which aid public water systems in implementing wellhead protection plans and in preventing & resolving water quality issues. Grants can be used for activities such as public education, installing monitoring wells, inspection, emergency response planning, and connecting private users to a public water supply.

- Projects and Practices Grants from the Board of Water and Soil Resources (BWSR) support groundwater/drinking water protection for both public and private supplies through a Drinking Water sub-grant allocation. Funding is provided through the CWF. Grants to SWCDs fund sealing of unused wells (also noted below) and other protective land treatment practices in vulnerable DWSMAs.
- BWSR also supports Wellhead Protection Partner Grants to local governments to establish permanent or long-term protection of land in wellhead protection areas with highly vulnerable drinking water supplies. These grants are intended to allow for alternative land uses to protect groundwater while allowing the partner more flexibility than a state-held easement through the CREP or RIM easement programs.
- Watershed-Based Implementation Funding (WBIF) is becoming a larger source of funds for local watershed partnerships than the competitive grant programs listed above. These large non-competitive grants are made available to watershed partnerships with approved Comprehensive Watershed Management Plans (CWMPs) to implement activities identified in those plans. If source water protection activities are identified in a CWMP for a specific watershed, then WBIF may be available for such activities.
- Source Water Protection: Federal funds can also be available for drinking water protection. At least 10% of the 2018 Farm Bill funding for conservation programs (excluding the Conservation Reserve Program) is allocated towards state source water protection priorities. Among the regionally focused programs that distribute these funds are the Mississippi River Basin Healthy Watershed Initiative (MRBI) and the National Water Quality Initiative (NWQI).

Private wells: A limited number of federal and state loan and grant programs are available for home water treatment and well construction, repair, and sealing, although eligibility is often income-limited.

- AgBMP Loan Program: Loans can be used for home water treatment, well replacement, connecting to public water, well sealing, and other practices that prevent water pollution. Financing is available for existing private wells that provide drinking water for people or livestock.
- CWF-supported Source Water Protection Grants, fund sealing of unused private wells in DWSMAs, since unsealed wells can act as a pathway for contaminants.
- Clean Water Fund Competitive Grants from BWSR (aka Projects and Practices grants) also fund sealing of unused private wells in DWSMAs. Funds are disbursed to Soil and Water Conservation Districts (SWCDs).

- Low-income families living in rural areas and small communities may qualify for home water treatment and well construction, repair, and sealing, with funds provided through the U.S. Department of Agriculture's Rural Development office.
- Fix Up Home Improvement Loan Program: Loans are available to homeowners with low to moderate incomes for home water treatment and well construction, repair, and sealing through the Minnesota Housing Finance Agency.

Overview: System Strengths and Issues

Strengths

The Water Management Framework and Watershed-Based Management Approach

Voter passage of the Clean Water Land and Legacy Amendment in 2008 demonstrated the public's long-term commitment to actions needed for clean and sustainable water. Minnesota's state water agencies developed the Minnesota Water Management Framework to clarify roles and enhance coordination at the major watershed scale. The Framework defines five categories of work in an adaptive management approach (plan-do-check-adapt). Agencies deliver and coordinate their work collectively and with local partners through activities in each of the framework's five categories. The goal of the Framework is to improve the effectiveness and efficiency of water management while empowering local action for clean and sustainable water statewide.

GAF Finding

Participants noted that the watershed scale is too broad and at times misaligned for management of groundwater for drinking water. Some believe planning at the aquifer or multi-community scale would be a more sustainable option for the resource.

Minnesota's watershed-based management approach also promotes increased collaboration and a common vision for planning and implementation activities, including a regular schedule for watershed monitoring and assessment, not limited by county or other jurisdictional boundaries. Partnerships between state agencies, Tribes, local governments, and other stakeholders play a key role in successful resource management as they prioritize, target, and measure Clean Water Fund activities.

Public Systems

MDH and its partner agencies and organizations have maintained a proactive and collaborative approach in protecting drinking water, including:

- Maintaining an exceptionally high rate of SDWA compliance, with nearly 98% of the 6,649 public water systems statewide meeting all federal health-based standards in 2022.
- Source water protection activities, including MDH/Minnesota Rural Water Association (MRWA) assistance to public water systems, with approximately 800 systems having completed Source Water Protection Plans. These plans define a protection area for drinking water sources, the Drinking Water Supply Management Area (DWSMA), inventory water quality threats within it and identify strategies to monitor and manage these potential threats over time.
- MDH performs sanitary surveys – on-site inspections of a water system's facilities and operations – more frequently than required under SDWA regulations. MDH inspects every 18 months for community systems and every 3 years for noncommunity systems, compared to the 3 and 5 year cycles required under SDWA.
- Operator training and certification program support for between 1,300-2,000 operators a year in collaboration with MRWA and American Water Works Association (AWWA).
- Extensive monitoring for emerging contaminants beyond SDWA requirements, including the Unregulated Contaminants Monitoring Project, the Pathogen Project, Statewide PFAS Monitoring Project, cyanazine sampling, etc., which will be incorporated into the Drinking Water Ambient Monitoring Program at MDH to assess drinking water vulnerability to CECs and characterize groundwater quality.
- Funding projects via the Drinking Water Revolving Fund and funding source water protection plan implementation and activities under Source Water Protection Grants. For example, since the SWP Grants program started in 2010, over 1,000 grants have been awarded to public water systems, totaling over $7 million. These modest grants allow systems to take actions to prevent water sources that otherwise may not easily or quickly happen.
- Engaged, experienced, and committed staff.

Well Standards and Management Activities (includes both private and public systems)

- Strong Well Code that is looked upon as an example by other states
- Well sealing program
    - Over 310,000 total wells and borings sealed in Minnesota since 1974
- Active inspection program annual goals are being met
    - 100% of new public water supply wells
    - 25% of new private water supply wells

- Licensing of well and boring contractors
    - New licenses and annual renewal
    - About 280 companies licensed and 360 individual representatives certified each year
    - CEU training online and available to participants for renewal

Water Quality and Health Risks

- Different research backgrounds among scientists, providing different viewpoints and ideas regarding human health risk assessment (e.g., metals, cancer, exposure, data harvesting, policy).
- Innovative approaches to the rapidly changing and challenging landscape of emerging contaminants, e.g., collaboration with EPA to 1) develop methods for ranking CECs for guidance based on exposure levels; and 2) develop tools for creating health risk guidance for CECs that have little or no data.
- Culture of continuous improvement and willingness to challenge federal standards considered insufficiently protective.

Issues to Address:

There are issues to address from the source of drinking water (lake, river, stream, groundwater) all the way through consumption and consumer's perceptions of drinking water, as shown in Figure 4. The infographic below gives an overview of the categories of issues: source water,

infrastructure, and tap water (what people experience inside their home). Below the graphic is more detail about the issues Minnesota will need to address.

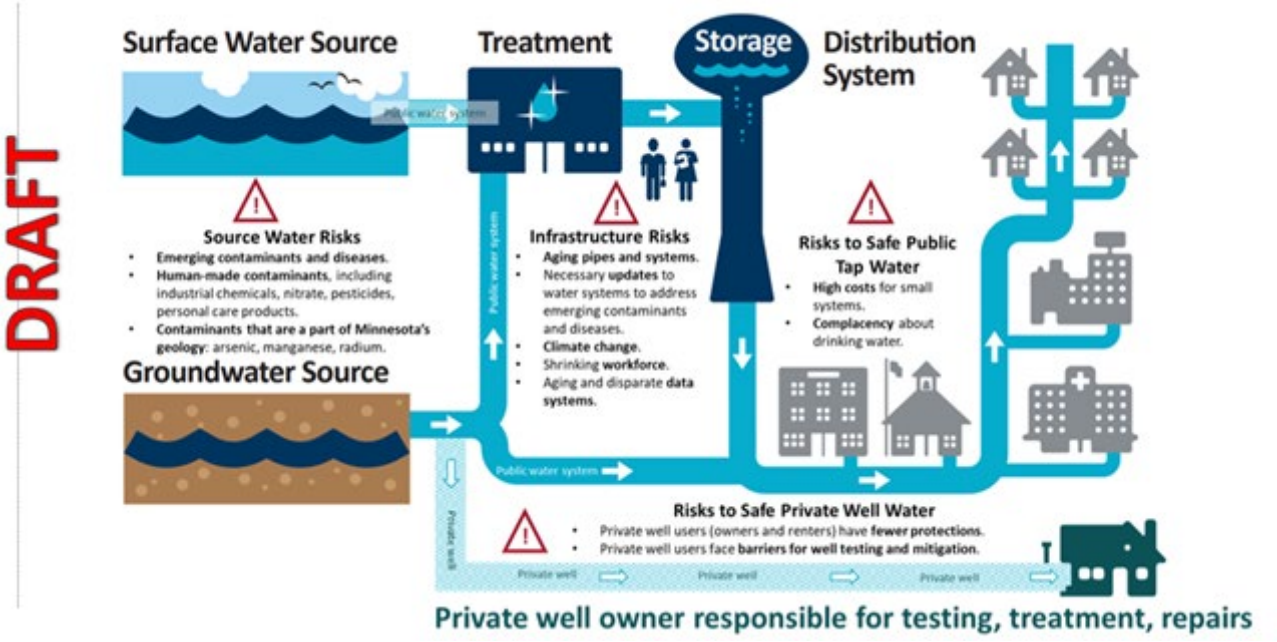

Figure 4: Minnesota drinking water systems in Minnesota get their water from both surface and groundwater. Issues including source water protection, infrastructure, costs, and lack of regulations effect all systems.

Issues to address at the source

- **Gaps between the Clean Water Act and Safe Drinking Water Act**; coordinating with state agencies and other partners to harmonize efforts and share information about water resource issues that affect drinking water sources.
- For private wells, **there is no regulatory pathway for the polluter to pay** for nonpoint source pollution.

Issues to address with infrastructure

- **Public water systems**
  - System compliance and technical assistance with **multiple new and revised federal regulations** (Lead and Copper Rule Revisions (LCRR) including lead service line (LSL) inventories, PFAS National Primary Drinking Water Regulations (NPDWR), Consumer Confidence Reports (CCR), Microbial and Disinfection By-Products (MDBP) Rule Revision).
  - While funding to address contaminants of emerging concern has increased, **funding to address "legacy contaminants" remains extremely limited** for

contaminants such as nitrates, TCE, 1,4-Dioxane, etc., and naturally occurring chemicals such as manganese and arsenic.

- Huge **influx of federal infrastructure funding, as well as state funding** for lead service line replacement, **presents opportunities and challenges**, specifically the staffing and capacity needs for administering, processing, and communicating about the funds.
- **Aging/outdated data systems** and difficulty in updating/replacing them.
- **Ensuring health equity in program implementation**. For example, needed upgrades to smaller public water systems can impose significant costs on ratepayers. (Ninety percent of public water systems serve fewer than 3,3000 customers.)

- **Private wells**
  - **Limited regulations for private wells** after the point of construction
  - **Health equity issues**
    - **No federal agency takes responsibility** for oversight of private wells.
    - Private well owners essentially must **act as their own well operators**; this is a high burden of technical capacity or knowledge, especially in comparison to a public water system customer.
    - Millions of dollars come from federal and state government for public water infrastructure, but there is **no parallel investment for private wells**. There are sociocultural barriers against spending public funds on private properties – although the recent funding for lead service line replacement in public systems represents a new approach.
    - While public funds are available for engineering and structural improvements on privately-owned agricultural land, and for addressing privately-owned poorly constructed SSTS systems, **no public funds are available for improvements to a private well**.
    - There may be **inequities due to language, education, and economic barriers among private well users**, but we lack sufficient data to assess whether such inequities exist. For example, renters may occupy homes with private wells with unsafe drinking water but be unaware of the problem and lack agency to address the issue.

        - **Some populations are more vulnerable** to being affected by contaminants in private well water (e.g., pregnant people and young children), but we lack information on what percentage of private well households are made up of these groups or how to reach them.
    - **Climate change may disproportionately affect private well users**. For example, high levels of groundwater use for irrigation in response to drought can draw down water levels in nearby private wells and can even leave households without drinking water. Flooding can make private wells unusable.

- **Workforce**
    - **Loss of institutional knowledge** in the workforce with retirements, finding and training qualified new staff, working successfully in contemporary work settings (remote work, culture of staff less likely to stay with program for decades).
    - **Workforce shortages and capacity at local level**, including finding skilled staff to replace retiring water operators and well contractors, and variable local capacity to manage complex, regional groundwater issues and source water protection projects.

Issues to address at the tap/in the home

- **Public water systems**
    - **Water rates may create cost burdens** for under-resourced households, especially in small communities.
- **Private wells**
    - **No legal support for addressing geogenic** (geology-based, not pollution-related) **contaminants** in private wells.
    - Public water systems must communicate with their customers; **no parallel line of communication** exists for private wells.
    - Private well owners have a big responsibility to ensure their water is safe, with regular voluntary testing, repairs, and mitigation. There are **knowledge and resource gaps** for private well owners to carry out this work.
- **Unserved populations and inadequate drinking water supplies**
    - There are populations within Minnesota that **lack reliable access to safe drinking water**, such as unhoused or transient populations, but we lack reliable information as to their locations and needs.

- Some Minnesota households may also lack **full connections to indoor plumbing**, including water supply; further research will be needed to better understand this issue.

Emerging issues to address

- The pressure for monitoring and addressing PFAS contamination may impede the **ability to assess health impacts from other emerging chemicals or legacy chemicals** in drinking water.
- The common belief among Minnesotans that the state's waters are pristine can result in programs being tasked with **"chasing zero" for contaminants**.
- **Risk assessment for chemicals found in drinking water is mostly reactive**, due to funding and staffing issues. Once a chemical is found in drinking water, it is too late to prevent contamination and exposure. People have already been exposed.
- **Water shortages due to climate change** may force the state to embrace water reuse and aquifer recharge. Health impacts need to be central to all discussions regarding these types of technologies. Chemical and microbial issues may be prohibitive unless addressed in a meaningful way. At this point, there is no clear pathway to safe and sustainable water reuse.

Communications issues to address

- **Improving communications** – with public at large (including risk communication), with public water systems, with media, across agencies and programs, and within DWP. Combatting the complacency that audiences may have about drinking water, raising awareness of drinking water issues, and encouraging actions to reduce risks to source water quality and consumers' health.
- Helping communities, the media, and partners understand the complex economic, policy, social, and capacity-related **factors that drive local land use and water resource decisions**, the implications for drinking water sources, and the potential public health trade-offs and risks.
- **Private well users have a lack of voice** in our political system because they are disparate—there is no one unifying/organized body that speaks up for them.
- **Improving documentation** of program policies, practices, and procedures to make them more understandable to multiple audiences.

Proposed Goals, Strategies, and Actions

These proposed goals, strategies, and actions aim to build on existing strengths and address the issues named in the previous section. Some of the goals, strategies, and actions also pull directly from existing strategic plans.

Vision: Everyone, everywhere in Minnesota has equitable access to safe and sufficient drinking water.

Protect sources of drinking water

Protecting drinking water at the source reduces the burden on public water systems and private well users. Minnesota has many programs and partnerships in place to help protect sources of drinking water. Key challenges for this work are to improve coordination among state agencies and partners, to ensure that private wells are included in efforts, and pairing short-term strategies to protect public health now with long-term strategies to restore water sources.

Key strategies and actions:

- Identify and manage potential threats around drinking water sources for public water systems and private wells.
    - Continue conducting an Inner Wellhead Management Zone survey[1] with public water suppliers during the wellhead protection planning process (for community systems) or during a sanitary survey (for noncommunity systems).
    - Continue providing assistance in developing Wellhead Protection Plans for all public water systems in the wellhead protection program.
    - Protect the approximately 400,000 acres of vulnerable land surrounding DWSMAs statewide by 2034.[2]
    - Develop a risk ranking framework that can be used to set priorities for public water systems and partners for addressing potential sources of contamination in DWSMAs.
    - Fully implement the Groundwater Protection Rule (GPR) in DWSMAs with nitrate concentrations above defined thresholds.
    - Determine how to better support private well owners in identifying and managing potential threats around their well.
- Emphasize source water protection in watershed management.[3]

[1] The 200 foot radius around the well is the Inner Wellhead Management Zone (IWMZ).
[2] Strategies and actions listed in the Clean Water Council Strategic Plan (PDF).
[3] Strategies and actions listed in the 2020 State Water Plan: Water and Climate (PDF)

- Prioritize watershed management plan creation and implementation in watersheds upstream from surface water intakes.[3]
- Provide financial assistance for source water implementation activities through grants to satisfy 50% of demand through 2034.[2]
- Protect, restore, and increase perennial cover in the highest priority areas of the Mississippi River watershed.[3]
- Prioritize watershed management plan implementation for townships in which private wells exceed the health risk limit of 10 milligrams per liter (mg/L) for nitrate.[3]

- Ensure adequate supply of water for public water systems and private wells.
  - Improve coordination with DNR on well interferences and water appropriations.
- Educate about and enforce laws, rules and ordinances that help protect sources of drinking water.
  - Review statute language to ensure it is adequate, applicable, and efficient.
  - Revise the Wellhead Protection (WHP) Rule to best align with current programmatic needs and goals.

Establish resilient drinking water infrastructure

Three types of drinking water infrastructure present risks: physical infrastructure (e.g., water pipes and treatment systems), workforce, and data systems. As public water systems age and as we learn more about emerging contaminants and diseases in water, public water systems will need to update and upgrade their treatment and distribution systems. This presents a cost burden. This burden is even greater for systems with a smaller customer-base because the cost remains high and is distributed among fewer households.

The workforces for water treatment systems and well construction is shrinking. People are retiring or moving on from these professions, and there is minimal interest in filling these jobs. Yet, safe drinking water is not possible without water system operators and well contractors.

Drinking water quality data is stored in aging and outdated data systems. Additionally, private well water quality data is disparate, limited, and not always integrated into other drinking water quality data. Updated and more integrated data systems will improve coordination among local and regional public water systems and improve access to private well data.

GAF Recommendation

Make data more shareable across agencies and with the public. Consider an accessible, one-stop shop for drinking water-related data.

Key strategies:

- Support communities with asset management and resiliency planning for drinking water infrastructure.
    - Continue to provide low interest loans through the State Revolving Loan Fund to address aging infrastructure.
    - Support smaller cities in developing asset management plans and funding critical improvements.
    - Prioritize capital improvements to maintain function and operations.

GAF Recommendation

Increase financial resources for drinking water suppliers and provide guidance to help them make decisions among trade-offs for investing limited resources.

- Support and grow the public water system and well contractor workforces.
    - Build out scope of local conservation staff responsibilities to include public health perspectives, as well as support for private well owners.
- Update and build resilient data systems.
    - Develop a database that supports a paperless process for online submittal of well records and payment.
    - Develop an application that supports paperless inspection reports for field staff.
    - Modernize the Minnesota Well Index to improve how we make public data available.

GAF Recommendation

Focus on professional development needs and building professional capacity. Ensure post-secondary training programs are available with the needed capacity and content. Identify ways to increase job satisfaction and confidence, such as by facilitating networking with professionals across a region, promoting competitive salaries and job security, and promoting the profession of utility management.

Ensure safe tap water

We want all people in Minnesota to be confident in drinking the water that comes from their tap.

Key strategies

- Strengthen implementation of the Safe Drinking Water Act for public water systems.

    - Reduce health-based violations.
    - Establish a process for funding to replace the private side of lead service lines.
- Establish equitable access to private well testing and remediation.
    - Provide educational resources, technical assistance, and financial resources to private well owners for well testing and treatment.
    - Establish equitable access to laboratories that accept water samples from private well users.
- Engage households in thinking about their tap water.
    - Hold focused conversations with communities around the state to understand their concerns and priorities with drinking water.
    - Conduct a statewide assessment to better understand private well users' knowledge, attitudes, and beliefs about well water, testing, and mitigation.

GAF Recommendations

Pay more attention to supporting the owners/managers of private drinking water wells. This may include promoting water testing, providing information about risks, and providing financial support for treatment.

Potential strategies include adult education opportunities about drinking water topics available online and in person, relating drinking water issues to peoples' daily lives, use "one water" messaging, focus on reaching the most vulnerable or impacted communities, establishing community appointed messengers, collaborative planning exercises.

Anticipate and manage emerging risks

Key strategies

- Monitor drinking water sources for emerging contaminants and diseases.
    - Establish an ambient monitoring program of drinking water sources: assessment, analysis, mapping, coordination with local partners.
- Understand how humans may be affected by unregulated contaminants and emerging risks.
    - Continue to develop water guidance (Health Risk Limits, Health-Based Values, and Risk Assessment Advice) for contaminants found in drinking water.
- Prioritize emerging risks that present the largest public health burden.
    - Incorporate comparative risk assessment to identify and prioritize emerging risks.

- Evaluate the need for Minnesota-specific regulatory values for drinking water. (WPC)
- If Minnesota-specific regulatory values for drinking water are needed, determine a process to develop those values.

- Advance laboratory capacity and methods to deal with emerging risks.
  - Ensure the State Public Health Laboratory has capacity to maintain methods and instrumentation.
  - Support the State Public Health Laboratory developing new methods in collaboration with laboratory scientists when needed.
  - Provide checklists and other tools for laboratories accredited through the Minnesota Environmental Accreditation Program to ensure submission of reliable and consistent data.

- Coordinate efforts and advance policies to manage emerging risks to drinking water.
  - Develop tools, provide training, and interpret findings that assist partners' (including Minnesota Department of Agriculture; Minnesota Pollution Control Agency) need to assess potential health risks posed by drinking water contaminants.
  - Assess emerging risks associated with climate change and advance policies to increase statewide resilience and public health preparedness.

Engage partners

Key strategies

- Communicate with and support the regulated community.
  - Continue to educate external partners and the regulated community to reduce health-based violations.
  - Implement new agreements to strengthen process and better relationships with delegated well programs.

GAF Recommendations

Proactively create more public facing explanations of the drinking water supply system, how it is managed, and how to access and use the quality reports. This might be state level communications, or resources that utilities can use for local communication.

- Provide partners and residents with data on risks and challenges to safe drinking water.

- Continue development of Groundwater Restoration and Protection Strategies (GRAPS), a process that includes information delivery, tool development, financial assistance, and education and training.
- Help the public and decision-makers understand health risks for various contaminants found in drinking water.

- Facilitate outreach, education and assistance to communities affected by drinking water contamination.
  - Maintain and build capacity and capability to receive requests for drinking water advisories from partners and issue Well Advisory Letters to private well owners.
- Leverage advisory councils to understand and prioritize challenges to safe drinking water.
  - Continue convening the **Advisory Council on Wells and Borings.**

Appendices

Appendix A: Lessons from Drinking Water Professionals: An Assessment of Drinking Water Governance in Minnesota

Lessons from Drinking Water Professionals: An Assessment of Drinking Water Governance in Minnesota (umn.edu) (https://conservancy.umn.edu/handle/11299/259166)