Improving water quality 25% BY 2025













Southwest Minnesota













Dear Fellow Minnesotans,

In the land of 10,000 lakes, clean water should be a right, not a privilege. But the reality is that the quality of our lakes, rivers, streams, and groundwater is threatened from many sources all across our state. We are at a crucial moment – we can continue to let water quality become worse or we can work together to reverse the damage that has been done and prevent future water degradation. That is why your involvement in this summer's Community Water Meetings is so important.



It will take all of us working together to protect our waters for ourselves and future generations. That is why, after hearing from citizens and experts at Water Summits in Morris and St. Paul, I set the goal to improve our State's water quality 25 percent by 2025. This goal does not mean that every pollutant will be reduced by 25 percent; it does not mean that every part of the state will improve 25 percent; but it means that in aggregate for the state and the many pollutants there will be a 25 percent improvement. At the current level of effort, there will be only a 7 percent improvement statewide, and without further action, water quality will get worse.

To be clear, this is not a regulation. More importantly, it is a call to action and the reason for Minnesotans to gather for Community Water Meetings this summer. I want to hear from people in every part of our State about the water concerns in their communities, how it will benefit our economy and quality of life to improve water quality, and what we can do to make greater progress toward clean water.

Thank you for your commitment to improving Minnesota's water quality.

Sincerely,

Governor

Good to know: Southwest Minnesota

Before modern agriculture, most of Southwest Minnesota was a treeless prairie with hundreds of species of wildflowers and grasses. Now, land use in this region is primarily agriculture, with most land in row crops, pasture, and animal agriculture.

Buffalo Ridge, a plateau of land untouched by the glaciers, extends through Southwest Minnesota. It is a drainage divide, separating the watersheds of the Mississippi and Missouri Rivers. Its altitude and high average wind speed have made it popular for wind energy development.

The clay soil and solid bedrock of Southwest Minnesota—along with lower annual precipitation compared to parts of the state—make groundwater quantity and quality a concern for this region.



Wind turbines in Jackson County, 2012

* Regions used for this project are from the Minnesota Association of Soil and Water Conservation Districts.



Three out of four Minnesotans get their drinking water from groundwater sources, but the groundwater is threatened by overuse and contamination in some places.



Major threats to groundwater



Nitrate — One of the most common water pollutants in Minnesota groundwater, affecting a large number of private wells and public water supplies. Elevated nitrate in drinking water can be harmful to human health, specifically to the health of infants. Septic systems, fertilizers, and manure are major sources of nitrate pollution in Minnesota.



Road salt — The salt applied to roads, parking lots, and sidewalks during our icy winters contains chloride, a water pollutant.



Overuse — In general, water is being drawn out of the state's aquifers faster than it is being replenished. If this overuse continues, groundwater may not be available as needed in the future.



Site-specific contamination — Land that is contaminated by hazardous substances and industrial pollutants such as Superfund sites — may affect groundwater nearby.

Good to know: Southwest Minnesota

Southwest Minnesota has challenges with both water quantity and quality. Drinking water sources in some areas are so limited that there are cities and rural water systems that have become partners in an innovative project called the Lewis & Clark Regional Water System. Water is drawn from beneath the Missouri River in Vermillion, South Dakota and piped to water systems in South Dakota, Iowa, and Minnesota. The project reached Minnesota in early 2015 and began serving Rock County Rural Water District. Other Minnesota partners are the cities of Luverne and Worthington and Lincoln-Pipestone Rural Water System, which serves an additional 38 communities in 10 counties in the state.

There are water systems in that area that have an adequate groundwater supply, but their groundwater has become contaminated and requires extensive treatment.



Lewis and Clark Regional Water System under construction.

Keeping lead out of drinking water

Water can pick up lead if it flows through lead pipe or plumbing. Because lead can be found in the plumbing of homes, all public water systems have to follow standards to make sure water does not easily dissolve lead while moving through pipes. Schools and homeowners can also test lead levels in their drinking water and learn about additional ways to reduce their exposure, like running water for 30-60 seconds before drinking.



Maximum nitrate-nitrogen concentrations in public and domestic wells



SOURCE: MDH & MGS



Public water supply wells

People in this region are almost entirely reliant on groundwater for drinking with the exception of surface water delivered from the Missouri River through the Lewis and Clark Regional Water System.

Public water supplies are monitored regularly for nitrate and other contaminants. It's increasingly common that public water supply systems need expensive nitrate treatment or are using strategies to reduce nitrate.

 In Southwest Minnesota, 18 public water supply wells, 4.4%, have nitrate above 3 milligrams per liter (mg/L).

When wells have levels of nitrate above 3 mg/L, preventative measures should be considered. The federal Safe Drinking Water Act standard is 10 mg/L. Public water supplies with nitrate levels above this standard must take action to reduce concentrations below 10 mg/L.

Public water supplies are protected from contamination by focused prevention activities. This region has about 136,000 acres prioritized for drinking water protection. Thirty percent of these are at high risk of contamination. To protect our water we need to target protection of high risk areas.

Good to know: Southwest Minnesota

Private wells

Thirteen percent of residents in this region obtain their water supply from a private well.

Private well testing results under the Township Testing Program are available for Rock and Nobles counties. In these high-risk areas, 78% of private wells tested are above 3 mg/L, a level at which preventative measures should be considered. Fifty-six percent of wells exceed 10 mg/L, which is above the safe drinking water standard and can lead to immediate health problems for some people, especially babies.

Well owners are responsible for testing their own water and treating it, if needed. In agricultural areas with vulnerable groundwater, private wells are sampled for nitrate and pesticides for free under the Township Testing program: www.mda.state.mn.us/ townshiptesting.





Our modern water infrastructure is something that most of us barely think about. We take for granted the drinking water, wastewater, and stormwater infrastructure built up over the last 100 years — and the hard work and public investment that goes into it.

Badly in need of attention

Many factors are putting stress on our water systems:



Systems are aging and equipment and pipes are at the end of or past expected life span.



Newly discovered contaminants and water quality standards are making it necessary for drinking and wastewater treatment to add new technologies.



Extreme rainfalls, made more common by climate change, can quickly overload storm drain systems and increase infiltration into sanitary sewers. The frequency of mega-rain events in Minnesota has been increasing sharply, and 2016 became the first year on record with two mega-rains in the state.



Water pipes extending eastward near Adrian, MN as part of the Lewis & Clark Regional Water System. Photo: The Waterline

Good to know: Southwest Minnesota

Wastewater infrastructure priorities

The 2017 Clean Water Project priority list for wastewater infrastructure projects in Southwest Minnesota includes 26 projects totaling \$141.3 million dollars. Most of these costs in Minnesota (90%) are to repair and replace aging treatment plants and sewer lines while a smaller portion are to address water standards. Old and aging sewer lines can let rainwater or groundwater into pipes, adding unnecessary volume to the system. Projects also include greater levels of treatment for phosphorus and chlorides and upgrades to unsewered areas with failing septic systems.

Drinking water infrastructure priorities

The Drinking Water Project Priority List has 31 projects to repair and replace aging treatment plants, water mains, and sewer lines, totaling \$59.4 million dollars.



In small towns there are fewer people to share the costs of expensive water projects that protect human health and the environment.

Swimming

Statewide, 40% of the lakes and streams in Minnesota are not meeting standards set for safe swimming, fishing or drinking.

Major threats to lakes

Contaminated runoff, erosion, and sediment —

Runoff from agricultural and urban land and lakeshore development raises the amount of phosphorus in Minnesota lakes, which in turn causes algae to grow and can fuel toxic blue-green algae blooms.



Road salt — The salt applied to roads, parking lots, and sidewalks during our icy winters contains chloride, a water pollutant. When snow and ice melt, the salt goes with it, washing into our lakes. At high concentrations, chloride can harm fish and plant life.

Invasive species — Non-native species, such as zebra mussels, Eurasian watermilfoil, and invasive carp, can cause economic or environmental damage or harm human health. About 5% of Minnesota's lakes are infested with invasives.



In watersheds dominated by agricultural and urban land, half or fewer of the lakes fully support the water quality standards for swimming because of elevated phosphorus, which causes algae to grow and makes lakes less attractive, or even dangerous, for swimming.

Good to know: Southwest Minnesota

Lake Shaokatan: A prairie lake with improving water quality

Many lakes and streams in Southwest Minnesota do not meet water quality standards. While it may seem daunting to think about making improvements, Lake Shaokatan is evidence that our efforts can be successful.



Lake Shaokatan now boasts clear shallows and a grassy lakeshore

Lake Shaokaton is west of Marshall, in the Minnesota River-Yellow Medicine River/Hawk Creek watershed. It is typical of many shallow lakes in agricultural watersheds. Toxic blue-green algal blooms once plagued the lake, but now it has all-time recorded lows of phosphorus, the nutrient that causes algae, and showing other signs of improvement. Improvements are the result of work to address feedlot runoff, farming and urban sources of pollutants, and failing septic systems.



Canada Goose goslings on a stream inlet to Lake Shaokotan, May 2017





Healthy fish need healthy lakes and streams. Much of our flowing water — including streams and ditches — is under threat from nutrient runoff and increased speed of flow.

Major threats to rivers

Straightened stream beds — Channeling, ditching, and damming projects have changed the natural course of **half of Minnesota's 83,000 stream miles**. This often leads to higher flow rates, bringing more pollutants to our waterways.

Drain tile and ditches in agriculture — Drain tile is plastic pipe installed under farmland to create optimum moisture conditions for crops. In tiled cropland, rainwater flows through tile drainage and ends up in ditches and streams, carrying nutrients along with it and causing streambank erosion. Use of drain tile in Minnesota is increasing.



Hard surfaces in urban areas — Hard surfaces, such as roofs, streets, and parking lots, abound in cities and towns. Rain washes across these "hardscapes" rather than soaking into the ground and carries contaminants into storm drains and on to rivers and streams.



Good to know: Southwest Minnesota

Most lakes and streams in Southwest Minnesota do not meet water quality standards

In the watersheds the MPCA has fully assessed, only 18% of the lakes in this region meet water quality standards for aquatic recreation—fishing and swimming. And in the Missouri River Basin, no lakes and few streams meet state standards for fishing and swimming. Problems include high levels of bacteria, phosphorus, nitrates, and sediment.



The Little Sioux River's small prairie streams flow through the southern portions of Nobles and Jackson counties and into lowa.

High and low flow in streams and rivers are a priority concern

Disturbances to the natural water pathways—such as tiling, drainage and stormwater runoff—are the most common problem in streams and rivers in this region. Both high (flood) and low flow conditions are problematic. In the Yellow Medicine River, focusing work to mitigate altered hydrology and minimize flooding is considered the top priority for the watershed.



Flooding in Rock County, 2014

Four things crucial for progress in MN



Water conservation: in agriculture, industry, and at home

Groundwater use has increased 35% over the past 25 years due to population and economic growth. This trend may not be sustainable. Parts of Minnesota are vulnerable to groundwater shortages. The state is not yet in crisis, but there are signs we may have problems in the future.

How we use water in Minnesota (average yr)



What we need to do

Our water supply makes Minnesota attractive to water-intensive industries, including agriculture, fishing, manufacturing, food production, micro brewing, mining, and shipping. But we need to encourage water conservation by both businesses and individuals.



► Improve industrial water efficiency and equipment.



- with conservation-based processes
- Use agricultural irrigation water more efficiently with technologies such as low-pressure irrigation and precision weather data.



Improve residential water use efficiency with technologies like soil moisture sensors for lawn watering and water efficient toilets.



Green infrastructure: managing runoff in cities and towns

Green infrastructure helps built and urban environments behave more like a natural landscape by holding water on the landscape after rain, rather than allowing it to rapidly run into storm sewers, lakes, and rivers.

Buildings, houses, parking lots, and roads mean less water soaks in



What we need

- Trees
- Pervious pavement ►
- Swales
- ► Rain gardens
- Infiltration strips ►
- Green street design
- Green roofs









Farming practices that protect water

Agriculture conservation practices are key. Many farmers are already using these methods, and programs are available to help get started.

What we need to do





Planting more **cover crops**, **buffer strips**, or **perennials** reduces erosion and can help recycle nitrate nitrogen before entering groundwater.

Applying nitrogen fertilizer at the proper **rate** and **time** minimizes loss to ground and surface water and improves farm profit. Installing more **grass waterways**, **sediment basins**, **and terraces** in targeted areas slows and filters runoff.

Perennial vegetation

Buffers protect water



Perennial buffers help maintain ditches by preventing erosion and fill-in

The 2015 buffer law

This designates about 110,000 acres of land to living cover to protect water from pollution. These buffer strips along rivers, streams, and ditches will filter out phosphorus, nitrogen, and sediment.

Conservation tillage

Farmers leave plant residues on longer, or permanently, helping keep soil and nutrients in the field.



Minnesota Agricultural Water Quality Certification Program

Participants implement a combination of these practices voluntarily to treat site-specific water quality risks.



Minnesota is fortunate to have some water bodies that meet, or are better than, our water quality standards. These lakes, streams, and groundwater sources need protection.

What we need to do

- Pay attention to wetlands and forested land to protect pristine waters.
- The cost of removing nitrate from water is much higher than keeping it out of the water to begin with.
 Follow Wellhead Protection Plans to protect drinking water sources.



Living cover: filtering and reducing runoff

Living cover is a key strategy for protecting drinking water, especially within lands surrounding a public water supply well, to keep contaminants from reaching the well or well field. Living cover holds water, filters contaminants, and reduces runoff.





Perennial crops: Perennial grasses, hay, and pasture.

Cover crops: Grasses, small grains, legumes, and winter annuals.



Wetlands: Natural and constructed.

Prairie and grasses: Grasses and s. prairie plants.



Forests: The king of living cover.

Minnesota's framework for improving water

Cleaner water through federal, state, and local collaboration in a "plan-do-check" cycle



Check: SW Minnesota

Watershed Restoration and Protection Strategy Reports (WRAPS) are available for the:

- Yellow Medicine
- Missouri River Basin
 in progress

Plan: SW Minnesota

One Watershed, One Plan is

a comprehensive management plan for groundwater and surface water. Two watersheds are using the program now, with more in the future:

- ► Yellow Medicine
- Missouri River Basin
 in progress

Do: SW Minnesota

Individuals and communities

can find support from local watershed organizations to:

- Implement conservation practices on your land
- Find out about financial resources
- Receive technical assistance
- Learn more about conservation practices

******* Investing in water: Southwest Minnesota

Helping Minnesota communities thrive

The Clean Water Fund, established by the Clean Water, Land and Legacy constitutional amendment in 2008, has been critical in moving many statewide water quality initiatives forward. The fund provides approximately \$85 million per year in funding to State agencies for implementation projects, including conservation work being done at the local level.

Examples of Clean Water Fund projects in Southwest Minnesota include:

- Livestock waste management system installed in Nobles County to help reduce bacteria levels in the Rock River
- Reducing nitrogen impacts to groundwater in the Verdi Wellfield in Lincoln County
- Replacement of failing septic systems in Pipestone County to reduce impacts to the Rock and Pipestone Rivers
- The Minnesota Agriculture Water Quality Certification Program has certified 65 producers in Southwest Minnesota, representing 45,819 acres, as of June 1, 2017



Protecting public supply wells: Worthington

Groundwater for water supply is hard to find in the Worthington area, so Worthington Public Utilities (WPU) has long made an effort to protect the resources on which it relies. Since 2006, the city, along with other local partners, has contributed nearly \$2 million to help set aside 520 acres of intensive agricultural land for conservation.

One of their most significant efforts was in 2014 when a critical piece of agricultural land in the city's drinking water supply management area went up for auction. The 150-acre parcel of land comprises an area in which the groundwater is particularly



vulnerable and connects to other existing conservation areas. Recognizing the benefits that parcel acquisition and protection would bring to wildlife habitat, drinking water protection, and surface water quality allowed WPU to bring together a broad-based coalition of partners to raise the \$850,000 needed to purchase the land. This successful effort culminated in a special dedication of the "Worthington Wells Wildlife Management Area" at the 2014 Minnesota Governor's Pheasant Opener.

Building momentum Resources to support your involvement

Sign up for email updates on 25% by 2025: www.eqb.state.mn.us/25by25

Test your private well: www.health.state.mn.us/divs/eh/wells/waterquality/test.html

Check the health of your lake or stream: www.pca.state.mn.us/data/surface-water

Make changes at home: www.pca.state.mn.us/12things

Participate in conservation programs through your county Soil and Water Conservation District:

- ► Technical assistance and guidance on projects
- ► Conservation Reserve Enhancement Program (CREP) and Reinvest in Minnesota Wetlands Program
- Minnesota's Erosion Control Cost Share Program

Encourage your city to join the Minnesota GreenStep Cities program: greenstep.pca.state.mn.us

Participate in the Minnesota Agriculture Water Quality Certification Program. Contact your local SWCD to apply; learn more at **www.mda.state.mn.us/awqcp**

Volunteer to monitor a local lake or stream: www.pca.state.mn.us/cmp

Connect with your watershed organization for education, volunteer opportunities, technical assistance, and connection to financial resources:

- ► Redwood-Cottonwood Rivers Control Area: www.rcrca.com
- ► Area II Minnesota River Basin Projects: www.area2.org
- ► Yellow Medicine River Watershed District: www.ymrwd.org
- ► Lac qui Parle Yellow Bank Watershed District: www.lqpybwatershed.org
- ► Le Sueur River Watershed Network: lesueurriver.org
- ► Your county Soil and Water Conservation District: www.maswcd.org
- ► Clean Up The River Environment (CURE): www.cureriver.org
- ► Greater Blue Earth River Basin Alliance: www.gberba.org
- ► Heron Lake Watershed District: www.hlwdonline.org
- ► Kanaranzi Little Rock Watershed District: klrwatershed.org
- ► Okabena Ocheda Watershed District: okabenaochedawd.org

