

WATER REUSE: EXECUTIVE SUMMARY

AUTHORED BY:

KYLE COLVIN
BRIAN DAVIS
RENE HEFLIN
MAUREEN HOFFMAN
JENNIFER KOSTRZEWSKI
JUDY SVENTEK
LI ZHANG

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Executive summary

Overall, the Twin Cities metro region has abundant water. But several factors loom that may compromise the future availability and quality of water resources in the region, including:

- Contamination
- Increasing potable water demand on finite groundwater sources
- Regulatory usage limits
- Changes in climate.

Sustainable water resources are needed for our region to grow and prosper. Through the Metropolitan Council's (Met Council's) statutory charge and partnerships, we protect the region's water resources. This supports our larger goal of the livability and prosperity of the metro region.

Water reuse is a tool to help ensure we have sufficient water supplies in our future. The two primary forms of nonpotable reuse currently implemented in Minnesota are stormwater and wastewater reuse. Stormwater reuse is the practice of harvesting stormwater runoff to meet water demands. Wastewater reuse is the practice of highly treating wastewater treatment plant effluent and reusing it for beneficial use.

Issue statement

Sustainable water resources are a necessary component of a growing, prosperous region, and water reuse is one strategy to ensure sustainability. Currently, we lack a clear process to implement nonpotable stormwater reuse in Minnesota that is adequately protective of our public health and includes flexible regulatory guidance. This process needs to be developed by regional stakeholders, the Met Council, and state agencies, to accelerate and expand water reuse in the region. Strong regional water policies and associated actions are necessary to promote water reuse and set the stage for a future with sustainable water resources.

Our role in water reuse

As the regional wastewater system operator, Metropolitan Council Environmental Services (Environmental Services) meets National Pollutant Discharge Elimination System and State Disposal System permit requirements. Our wastewater, surface water, and water supply planning functions work to promote sustainable water resources while addressing pollution and other factors impacting those resources for the seven-county metro region.

Our water planning role includes looking at current issues such as limited water resources or poor-quality water resources for drinking water, supporting healthy ecosystems, and providing for a high quality of life in the region. The intent of our work is to collaborate with partners to define ways to move these issues forward.

Currently, we are updating our Water Resources Policy Plan, which includes policies and implementation strategies related to our water resources, water supply, and wastewater planning roles, as well as information needed to operate the regional wastewater system. Our goal with the Water Resources Policy Plan is to ensure sustainable water resources through our planning and operations. Water reuse is an important tool to help promote sustainable water uses within the metro region and ensure clean water for future generations.

Equity and water reuse

Stormwater reuse can impact several equity concerns including affordable housing, gentrification, reduction of wastewater system inflow and infiltration, and water rates. If implemented correctly, stormwater reuse can benefit affordable housing developments and help to reduce the cost of water for their residents. Steps need to be taken to ensure that stormwater installations create these positive impacts. One such step is reducing regulatory barriers to encourage the integration of water reuse in developments. State and regional funds are available to offset the additional costs of stormwater reuse infrastructure and treatment systems, and anti-displacement strategies are in place to keep communities whole.

Crucial concerns for water reuse

Current state and reuse drivers

Currently, more than 50% of Minnesota's population lives in the Twin Cities metro region. The Mississippi River and the region's aquifers provide residents with reliable water supplies. Some areas of the metro have begun to feel stress on both the quality and quantity of their groundwater. Depletion of groundwater reserves in certain areas of the state have focused the attention on more efficient uses of water.

Figure 1 shows long-term declining groundwater levels in the north and west parts of the metro, suggesting limited groundwater supply in these areas. As demands on water supply grow due to population increase, urbanization, climate change, and increased irrigation and industry, water reuse is one tool that can help us promote water sustainability in the region and throughout the state.

Stormwater and wastewater reuse can be used for a variety of purposes:

- Conserve potable water for essential uses
- Improve and maintain watershed hydrology
- Reduce pollutant loading
- Reduce stress on existing water infrastructure
- Defer the need for additional water supply wells and treatment systems.

Both stormwater and wastewater treatment plant effluent can provide alternative supplies for non-potable water uses to enhance clean water security, sustainability, and resilience.

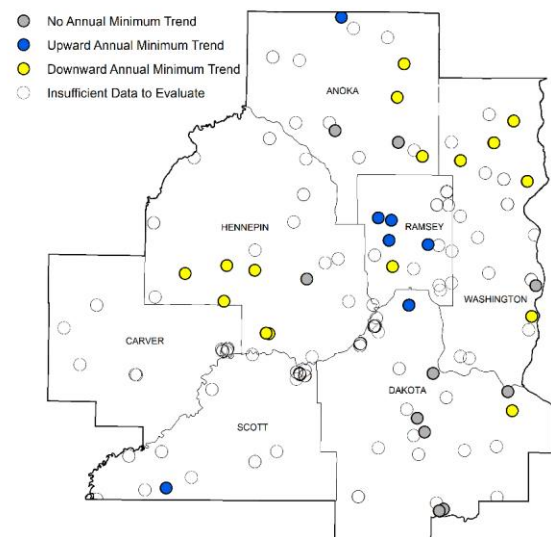


Figure 1: DNR observation well trends in annual minimum water levels (1993-2012) (Met Council, 2015)

Water reuse uses and barriers to widespread application

After sufficient treatment, stormwater and wastewater can be reused for a wide range of purposes. Generally, nonpotable reuse water is used for flushing toilets, irrigation, and for industrial processes. The regulation or guidance for reuse treatment is provided by multiple state agencies (Minnesota Pollution Control Agency, Department of Labor and Industry, Minnesota Department of Health) depending on the water source.

The lack of clear regulation is a huge barrier for the widespread application of stormwater reuse. Additionally, a lack of understanding of stormwater reuse water quality and system performance, and a lack of public health risk information, makes stormwater reuse difficult to implement. Regardless of the obstacles to implementing stormwater reuse in Minnesota, there remain multiple benefits. One of the major benefits is that it reduces demand on groundwater and surface water. Reduced demand can help reduce the need to expand water utilities and it saves energy.

In contrast, wastewater reuse has a regulatory path under the process for regulating wastewater treatment and disposal with its own standards. However, Met Council wastewater treatment does not remove all pollutants from water, which creates a barrier for reuse. Elevated levels of chloride in reuse water make it unsuitable for irrigation and create potential corrosion concerns. Other contamination concerns will continue to arise, for example PFAS contamination, which could delay or deter wastewater reuse in Minnesota.

Currently, both stormwater and wastewater reuse have treatment costs that makes it more expensive than municipal or groundwater supplies (Table 1). Additionally, the seasonality of source of reuse water and application must match. For example, irrigation can only occur five or six months out of a year. If water is not available due to drought, backup systems (water storage, potable water systems, or groundwater recharge systems) must be used, increasing the infrastructure costs. Until the economic, regulatory, and other drivers shift to force water reuse to be more feasible, it will be challenging to widely adopt water reuse for the region.

Table 1: Comparison of source water rates in the Minneapolis/Saint Paul region

Municipal drinking water- Surface water source^a	Municipal drinking water- Groundwater source^a	Environmental Services treated wastewater (non-potable)
\$6.87/1000 gal	\$2.50/1000 gal	\$5.37/1000 gal

^a Tabulated values are average 2020 retail rates.

Please see <https://metro council.org/Wastewater-Water/Planning/Water-Supply-Planning/Grants/Water-Rates.aspx> for individual community water rates.

Recommendations for water resource policy and related strategies/actions

The document's intent is to share our current understanding of issues, identify current policy connections or gaps, and to propose future policies and strategies to ensure sustainable water resources. Not all the recommendations included in this paper will move forward for inclusion into the Water Resources Policy Plan, and conversely, the Water Resources Policy Plan may include policies not discussed in this paper. The intent is to begin to develop a shared

understanding and conversation about the water reuse topic, which is connected to many aspects of our core services.

The scope of the issue presented in this research paper reveals the need for a regional One Water approach, increased strong regional policies, and better, more frequent collaboration to effectively clarify guidelines and promote water reuse within the region.

The Met Council's intent is to work in partnership with stakeholders in the region and state agencies to develop clear guidance and direction on how to safely implement reuse projects. Strong policies and coordinated water governance are vital to protect our regional waters.

We work with our partners in several ways to promote water reuse, including long-range visioning and planning, regional investments and system operations, technical assistance, and research. This white paper offers several policy and action recommendations in two areas that can help address current barriers to water reuse, to plan for future scenarios, and ensure the sustainability of our waters now and for many generations to come.

Stormwater reuse

Stormwater reuse in Minnesota currently does not have a clear process and guidance/regulatory structure. The following recommendations are a mix of immediate and long-term actions that will direct new stormwater reuse policies and actions in our 2050 Water Resources Policy Plan.

Proposed policy recommendation:

The Metropolitan Council will work with our state agency partners and impacted stakeholders to advance stormwater reuse to promote a more sustainable region.

Proposed actions:

- Metropolitan Council staff will share information and resources to help develop guidance for implementing stormwater reuse.
- Metropolitan Council staff, in collaboration with partners, will help to inform the direction on whether further guidance and/or regulation is needed for the various stormwater and rainwater reuse practices being installed in the metro area. This action will include working with partners and agencies to better understand the risks associated with all types of reuse before decisions are made about guidance or regulation.
- Metropolitan Council staff will work with agency partners to better define agency roles and responsibilities for reuse in Minnesota.

Proposed policy recommendation:

The Metropolitan Council will support stormwater reuse in Minnesota, where feasible, as a means of achieving water sustainability in the region.

Proposed actions:

- The Metropolitan Council will work in partnership with state and local governments to include internal and public outreach/acceptance campaigns to promote stormwater reuse as a viable water source.
- The Metropolitan Council will seek funding for grant programs to support the reuse of stormwater in the metro area, as appropriate.
- The Metropolitan Council will work with partners to remove obstacles, as appropriate, so reuse can become more commonly used to reach sustainable water resources in the region.
- The Metropolitan Council will implement stormwater reuse at our facilities (including for purposes of demonstration) in accordance with Minnesota Department of Health guidance as it is developed, NPDES permit requirements, and as is economically feasible.

Wastewater reuse

Our current policy related to reuse focuses heavily on the process to reuse wastewater from our Environmental Services wastewater treatment plants. In addition, the regulatory approach for reuse of wastewater is clearly identified and overseen by the MPCA. At this time, we are not proposing any changes to our approved process for wastewater reuse. We are proposing new wastewater reuse policy.

Proposed policy recommendation:

The Metropolitan Council will support the reuse of treated wastewater where feasible and appropriate.

Proposed actions:

- The Metropolitan Council will work in partnership with state and local governments to include internal and public outreach/acceptance campaigns to promote wastewater reuse as a viable water source.
- The Metropolitan Council will continue to work with partners to identify external opportunities to reuse treated wastewater and assist in the evaluation of this opportunity as one regional alternative to conserve potable water sources.
- The Metropolitan Council will identify criteria for viable wastewater reuse projects including, but not limited to, effluent contaminant concentrations to reduce the likelihood of expensive treatment.
- The Metropolitan Council will clearly identify on our website a contact to work with us on a wastewater reuse project.
- The Metropolitan Council will provide additional treatment to meet MPCA reuse requirements for internal use to advance our practice.

Clear policies and guidance are vital to implement and promote regional water reuse. This research paper includes policies to address region-specific stormwater and wastewater reuse concerns to help ensure abundant and clean water for future generations.