WASTEWATER PLANNING AND SERVICE CONSIDERATIONS

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Acronyms and abbreviations

DNR – Minnesota Department of Natural Resources
EPA –Environmental Protection Agency
I/I – Inflow and Infiltration
MDH – Minnesota Department of Health
MPCA – Minnesota Pollution Control Agency
MWC – Municipal Wastewater Charge
NPDES – National Pollutant Discharge Elimination System
PFAS – Per- and Polyfluoroalkyl Substances
PFOA – Perfluorooctanoic Acid
PFOS – Perfluorooctane Sulfonic Acid
RES – River Eutrophication Standards
SAC – Sewer Availability Charge
SDS – State Disposal System
TP – Total Phosphorus
TSS – Total Suspended Solids

Policy research approach

The Metropolitan Council (Met Council) is charged by state statute to develop plans for the growth and economic development of the seven-county Twin Cities metropolitan area (metro area). Publications like the metropolitan development guide (***Thrive MSP 2040***) and associated system plans, including the ***Water Resources Policy Plan***, are the primary vehicle for us to share our vision and goals for the region. They are updated every ten years but have a twenty-five-year planning horizon to allow for long-term development of the region. Each iteration of regional planning builds upon the previous effort, while adjusting our actions, policies, and vision to address current issues, mitigate future risks, and optimize regional opportunities.

The 2050 Water Resources Policy Plan, like the 2040 plan before it, will be an integrated plan that supports our core mission to operate and manage the regional wastewater system, provide water supply planning, and provide surface water planning and management throughout the region. It will serve as our guide to address issues affecting our waters, and to protect these resources for future generations.

This research paper is part of a series investigating current and future water concerns for the metro area. Together, these papers will inform our 2050 Water Resources Policy Plan. The paper topics are:

- Protecting source water areas
- Rural water concerns
- Water and climate
- Water availability, access, and use
- Water reuse
- Water quality
- Wastewater concerns

The project 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 the papers will move forward for inclusion into the Water Resources Policy Plan, and conversely, the Water Resources Policy Plan may include policies not discussed in these papers. The intent is to begin to develop a shared understanding and conversation about topics that are connected to all aspects of our core services.

Research paper topics were investigated using three core principles:

- **One Water, integrated water management:** The metro area is water-rich, and that water holds immense value. Integrated water management, also known as "One Water", addresses water as it moves from water supply, through wastewater systems and into surface waters. The ultimate goal of integrated water management is sustainable, high-quality water in the region.
- **Utilize existing systems:** The metro area has a robust water planning and wastewater operations system with many actors – community water and wastewater utilities, watershed management organizations, and regional, county, state, and federal agencies. Coordination and collaboration between these groups is necessary to protect our water for future generations.
- **Metric-based policies:** It is hard to quantify policy success without accountability. We will provide policy options with associated metrics and measurable outcomes where possible, to demonstrate the effectiveness of our water policies and actions.

Introduction and background

Environmental Services partners, plans, and provides services in the seven-county metropolitan area, including wastewater conveyance and treatment. A portion of the seven-county area uses wastewater treatment services through our collection and treatment system known as the Metropolitan Disposal System and the remainder use private wastewater treatment systems, either through municipal system, private communal systems, or through individual subsurface sewage treatment systems. The Metropolitan Disposal System serves about 2.8 million people and consists of more than 600 miles of interceptor pipes, 61 lift stations, 224 metering stations, and nine wastewater treatment plants. This critical infrastructure treats an average of 250 million gallons of wastewater per day and treated 82.1 billion gallons of wastewater in 2021.

The Metropolitan Disposal System is a crucial element in the region's future development and success. We provide treatment through the interceptor and treatment plants for urban areas and work with both Rural Centers and rural areas on wastewater collection and treatment issues. Annually, the region has invested $110 million on average for replacement, rehabilitation, and expansion of the disposal system. This paper addresses existing and new concerns for providing wastewater service that may impact operations and require us to pivot to continue to protect human health and the environment. The concerns addressed in this research paper include:

- Inflow and infiltration
- Vactor waste receiving
- Liquid waste receiving
- Requested acquisitions of rural wastewater treatment plants
- Contaminants of regulatory concern
- Centralized versus decentralized wastewater planning
- Wastewater surveillance

Reliable wastewater service depends on:

- Maintaining regional and community wastewater infrastructure and services.
- Assessing population and growth patterns.
- Adapting to and considering environmental drivers, like climate and geology.
- Meeting changing regulatory requirements.

These concerns and challenges may add financial hardship for communities and residents looking to dispose of waste and impact the level of service we can provide without the need for rate increases. As environmental regulations and conditions change, it is important to have policies in place to address the most pressing and impactful concerns and to ensure we achieve our vision of clean water for future generations.

Issue statement

Aging infrastructure is expensive to repair and maintain. If neglected, it can allow excess surface or subsurface water to enter the conveyance system and take up capacity otherwise reserved for growth. Adjusting wastewater treatment methods and technologies to meet changing nutrient limits is costly. Growth of the region may result in more users of the wastewater treatment system, leading to requested acquisition of local infrastructure and generating debate on how best to manage the wastewater treatment of the region.

Our treatment plants continue to achieve near perfect compliance with federal and state water discharge standards while keeping rates competitive. However, it is important to address upcoming challenges to maintain that level of service. Planning for and mitigating these concerns will help extend the life of the regional wastewater system, ensuring the growth of a healthy and prosperous region.

Our role

As the regional wastewater system operator and wastewater, surface water, and water supply planning agency for the seven-county metro area, we strive to ensure sustainable water resources through intentional planning and operations. Our wastewater treatment plants continually meet National Pollutant Discharge Elimination System (NPDES) Permit requirements. Our wastewater, surface water and water supply planning functions work to promote sustainable water resources while addressing the pollution and other factors that impacts those resources. Clean water for drinking, recreating, and treated by our wastewater treatment plants all are important parts of the region's livability and prosperity. We work with our partners, our regional influence, and perform our statutory responsibilities to protect and preserve our water.

We have three primary water planning focuses supported by state and federal statutes.

- **Wastewater:** We prepare a comprehensive development guide consisting of policy statements, goals, standards, programs, and maps prescribing guides for the orderly and economical development of the region. The regional wastewater collection and treatment system one of the four regional systems included in this effort (Minn. Stat. § 473.145).

- **Water Resources Management:** Consistent with state and federal law the Council adopts a water resources plan and a regional management plan to address pollution from point-sources, such as treatment plant discharges, and nonpoint sources, such as stormwater runoff (Minn. Stat. § 473.157; 33 U.S.C. § 1288).

- **Water Supply Planning:** We are required to create plans to address regional water supply needs, including the regional Master Water Supply Plan, develop and maintain technical information related to water supply issues and concerns, provide assistance to communities in the development of their local water supply plans, and identify approaches for emerging water supply issues (Minn. Stat. § 473.1565).

As a part of our statutory authority, we are required to review and comment on Local Comprehensive Sewer, Local Surface Water Management, and Local Water Supply Plans (as

described in Minn. Stat. § 103G.291, subd. 3) to ensure that they are in conformance and compliance with the regional plans.

Environmental Services maintains a Customer Level of Service for operations and work for the region. It is the lens through which operating strategies, maintenance programs, and capital program development are evaluated, and decisions are made.

Our level of service was developed in collaboration with many of our customers. The customer level of service represents the commitment that Environmental Services has made as we plan, design, operate, and maintain the regional wastewater system. It is defined through three lenses: (1) financial; (2) public health, safety and environmental protection; and (3) customer service.

Our decisions and actions consider whether they provide a regional benefit to the system. From the wastewater perspective, an action or decision is a regional benefit if the action supports regional growth, is a benefit to more than one community, is cost effective, and enhances knowledge and experience that can be used to further our vision. We are proud of the regional investments made to ensure clean water for future generations.

Table 1 shows excerpts from several Council statutory requirements to treat wastewater in the metropolitan area and excerpts from several related statutes that impact wastewater operations:

Table 1: State statutes connected to wastewater service and operations

Minnesota statute	Wastewater connection
473.146 Policy Plans for Metropolitan Agencies	The council shall adopt a long-range comprehensive policy plan for transportation and wastewater treatment. The plan must substantially conform to all policy statements, purposes, goals, standards, and maps in the development guide developed and adopted by the council under this chapter.
473.157 Water Resources Plan	To help achieve federal and state water quality standards, to provide effective water pollution control, and to help reduce unnecessary investments in advanced wastewater treatment, the council shall adopt a water resources plan that includes management objectives for watersheds in the metropolitan area.
473.175 Review of Comprehensive Plans	The council shall review the comprehensive plans of local governmental units, prepared and submitted…to determine their compatibility with each other and conformity with metropolitan system plans.
473.191 Local Planning Assistance	The Metropolitan Council may, at the request of local governmental units, enter into contracts or make other arrangements with local governmental units and others for the provision of services for

	and assistance with comprehensive community planning.
473.242 Urban Research	…the Metropolitan Council may study the feasibility of programs relating but not limited to water supply, surface water drainage, communication, transportation, and other subjects of concern.
473.504 Wastewater Services, Powers	The council shall have the power to adopt rules relating to the operation of any interceptors or treatment works operated by it and may provide penalties for the violation…
473.505 Total Watershed Management	The Metropolitan Council may enter into agreements with other governmental bodies and agencies and spend funds to implement total watershed management. "Total watershed management" means identifying and quantifying at a watershed level the (1) sources of pollution, both point and nonpoint, (2) causes of conditions that may or may not be a result of pollution, and (3) means of reducing pollution or alleviating adverse conditions.
473.511 Sewer Service Function	Subd. 1 …the council shall assume ownership of all existing interceptors and treatment works which will be needed to implement the council's comprehensive plan for the collection, treatment, and disposal of sewage in the metropolitan area…and shall thereafter acquire, construct, equip, operate, and maintain all additional interceptors and treatment works which will be needed for such purpose. Subd. 2 The council may require any local government unit to transfer to the council, all of its right, title, and interest in any interceptors or treatment works and all necessary appurtenances thereto owned by such local government unit which will be needed for the purpose stated in subdivision 1. Subd. 4 The original cost of a facility shall be computed as the total actual costs of constructing it, including engineering, legal, and administrative costs, less any part of it paid from federal or state funds and less the

	principal amount of any then outstanding bonds which were issued to finance its construction.
473.513 Municipal Plans and Programs	As soon as practicable after the adoption of the first policy plan by the council…each local government unit shall adopt a similar policy plan for the collection, treatment and disposal of sewage for which the local government unit is responsible, coordinated with the council's plan...
473.515 Sewage Collection and Disposal Powers	The council shall have the right to discharge the effluent from any treatment works operated by it into any waters of the state in accordance with any effluent or water quality standards lawfully adopted by the Pollution Control Agency.
473.516 Waste Facilities; Sewage Sludge Disposal	Each sewage sludge disposal facility of the council, or site used for the disposal of sewage sludge of the council, shall be required to have an agency permit issued pursuant to agency rules for permitting sewage sludge disposal facilities and sites.
473.517 Allocation of Costs	Subd. 1 …the estimated costs of operation, maintenance, and debt service of the metropolitan disposal systems to be paid by the council in each fiscal year… shall be allocated among and paid by all local government units which will discharge sewage, directly or indirectly, into the metropolitan disposal system… Subd. 3 Amounts collected through the metropolitan sewer availability charge (SAC) must be deposited in the council's wastewater reserve capacity fund. Each fiscal year an amount from the wastewater reserve capacity fund shall be transferred to the wastewater operating fund for the reserved capacity costs…

Minnesota statutes outline the planning role for the Met Council, including wastewater collection and treatment planning and actions. Treatment requirements are outlined at the federal level through Section 208 of the Clean Water Act (33 U.S.C. § 1288). Minnesota statutes also give

the Met Council authority to adopt rules to meet those federal requirements. Pursuant to this authority, the Met Council has adopted Waste Discharge Rules to regulate use of public sewers, enforce applicable standards and requirements, and charge for services and activities necessary to carry out its obligations under federal and state law (Metropolitan Council, 2013).

Key issues

There are many facets to wastewater conveyance and treatment. This research paper specifically focuses on issues related to wastewater planning and service. Not all issues are addressed in this document. Additional comments and feedback are welcomed with preparing the 2050 Water Resources Policy Plan.

Inflow and infiltration

Inflow and infiltration (I/I) is stormwater runoff and groundwater that makes its way into sanitary sewer pipes, mixes with sanitary wastewater, and gets unnecessarily treated at wastewater treatment plants (**Figure 1)**. Inflow is clear water that enters the wastewater system through rain leaders, sump pumps, or foundation drains that are illegally connected to sewer lines. The largest amount of inflow occurs during heavy rainstorms. Infiltration is groundwater that seeps into cracked or broken wastewater pipes.

Figure 1: Examples of I/I

Local maintenance structure with significant inflow occurring below casting. Photo courtesy of City of Shoreview (left).

Local vitrified clay tile pipe with significant infiltration occurring at pipe joint. Photo courtesy of City of Burnsville (right)

We are concerned about I/I for the following reasons:

- I/I can result in public and environmental health concerns.
  When the combined amount of wastewater and clear water exceed the system capacity, untreated wastewater can back up into the basements of buildings or discharge into lakes, streams, wetlands, or other areas. Often these outcomes are a result of limited system capacity at the local level.

- I/I is costly to communities and utility ratepayers.
  The large regional pipes (interceptors) and wastewater treatment plants are designed for the wastewater needs of the region. Excessive I/I limits the available system capacity intended to accommodate the growth of the region and increases the wastewater

treatment costs, charged to local communities. Building additional capacity in the system to accommodate excessive levels of I/I wastes local and regional investments on improvements that are utilized infrequently to accommodate wet weather-related events.

- I/I wastes the region's valuable water resource.
  Clear water is uncontaminated water that does not require treatment prior to it being reintroduced to the environment, like precipitation, snow melt, surface or groundwater. When clear water discharged to the wastewater system is removed from the natural hydrologic cycle it reduces groundwater recharge potential.

System background

Initial development of sewers in the metropolitan area consisted of individual collection systems throughout the region conveying combined storm and sanitary sewer flow, also called combined sewer systems, to the Mississippi River. Many of these core facilities were built in the late 1800's and still exist today.

In the 1930's, Minneapolis and Saint Paul built interceptor sewers to collect this flow at the river discharge points and conveyed it to the newly built Metropolitan Wastewater Treatment Plant. The Metropolitan Sewer Board was created in 1967 to address the inadequately treated wastewater that was being discharged from the approximately 35 local wastewater treatment facilities in the metropolitan area. The state legislature created the Metropolitan Sewer Board to develop a modern regional wastewater collection and treatment system and meet the wastewater needs of a growing region.

Beginning in the mid-1980's, local and regional sewer separation efforts resulted in the sanitary sewer system currently operating as a non-combined system. This accomplishment culminated in the City of Minneapolis and the Met Council negotiating the termination of their joint Combined Sewer Overflow permit with the Environmental Protection Agency in 2018.

In June of 1987, the region experienced two major storm events within a three-day period that were preceded by unusually high precipitation conditions. Wastewater flow increased significantly in response due to excess I/I. This resulted in the failure of the interceptor crossing the Minnesota River in the City of Shakopee (**Figure 2**).

The failure resulted in raw sewage flowing into the river for weeks before an emergency repair could be completed. The event led to a consent decree (also known as a settlement agreement) between the Council and the Environmental Protection Agency. This led to a commitment by the Met Council to study and develop a plan to address system susceptibility to excess I/I.

Figure 2: Interceptor failure - Minnesota River

System investment (public versus private)

In 2002, we began a study to evaluate the effectiveness of local and regional I/I mitigation efforts that were incentivized by several I/I grants between 1994 and 2000. The 2002 study found that the local and regional wastewater system was still significantly impacted by wet weather I/I. The study also concluded that if left unaddressed, excess I/I in the system would result in the need for wastewater system capacity improvements by 2020 to accommodate anticipated growth.

In 2004, we developed the Regional I/I Program, with the assistance of a community representative task force. Communities that contributed excess levels of I/I (**Figure 3**) were assigned inflow and infiltration mitigation work plans. Inflow and infiltration levels are deemed excessive when the amount of I/I exceeds the normal flow threshold for a facility. Work plans are assigned if a community's flow meets or comes within 20% of that threshold. At sufficient levels, excessive I/I can cause overtaxed conveyance and treatment facility systems resulting in wastewater spills and sewage backups into homes and businesses.

As a result of implementing our Regional I/I Program, local communities completed I/I mitigation efforts to investigate and eliminate significant sources of I/I within local collections systems. Much of this work focused on the publicly owned portion of the system, with very little work focused on the private collection systems (individual service laterals) At the same time the Met Council has also invested over $100 million in locating and eliminating I/I sources within the regional collection system.

Although much work has been completed on the public portion of the collection system, continued work is still needed to address remaining sources of I/I and system susceptibility as infrastructure ages. Much of the work completed on the public system has focused on easily identifiable and cost-effective projects.

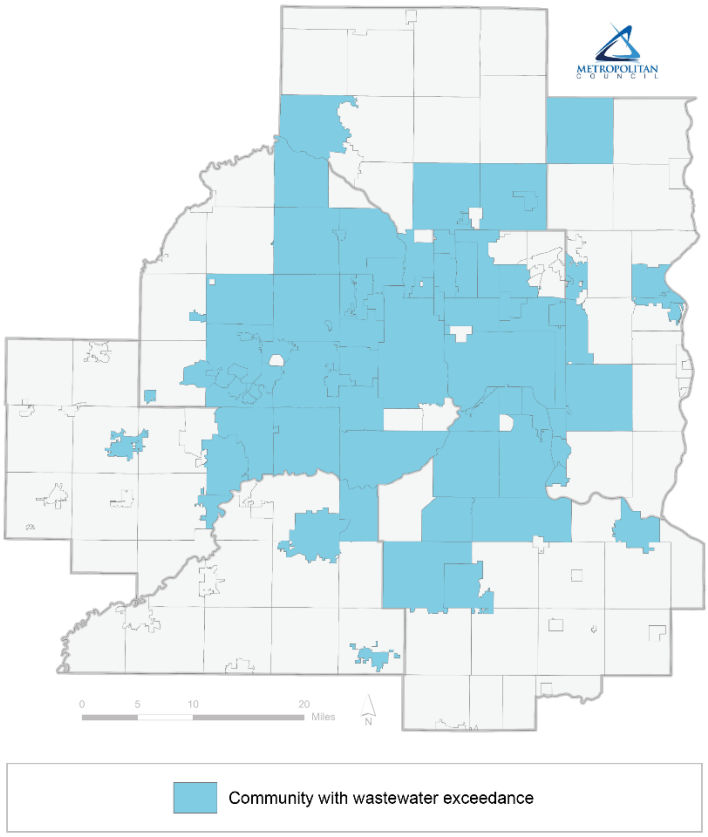


Figure 3: Communities with wastewater exceedances

Map of metro area communities served by the regional wastewater system that have exceeded or came within 20% of exceeding their assigned maximum flow limit since October 2005.

I/I reduction progress

Two storms display the progress in I/I reduction (**Table** 2). In October 2005, a rain event resulted in over 50 communities getting assigned I/I work plans as a result of exceeding their maximum discharge rate into the system. The next significant storm event occurred in June of 2014, and although over 40 communities were identified as exceeding their maximum discharge rate into the system and were assigned I/I mitigation work plans, the system peak flow was significantly less. Due to the recent drought conditions and lack of significant wet weather events and longer-term precipitation amounts, a more recent comparison of flow reduction cannot be provided. **Table 2** shows communities with work plans, as of 2022.

Table 2: Wastewater system flow response

Response at the Metro and Blue Lake Wastewater Treatment Plants after the October 2005 and June 2014 storm events

	Oct 4, 2005	June 19, 2014	Difference
Regional Precipitation (in) [1]	6.6	10.8	+62%
Annual Precipitation (in) [2]	32.2	37.7	+17%
I/I Goals Exceeded	50	49	
Metropolitan Plant (St. Paul) Peak Daily Flow [3]	449.6	420.9	-6%
Blue Lake (Shakopee) Peak Daily Flow [3]	92.8	70.9	-24%
Metropolitan Plant (St. Paul) Peak Hourly Flow [3,4]	633.4	559.9	-12%

1. Average total rainfall over the region that occurred September 19- October 4, 2005 and June 1-June 19, 2014.
2. Average total rainfall over the region that occurred in the 12 months preceding the event.
3. Flow in million gallons per day (mgd).
4. Peak hourly flow during events exceeded the capacity of Blue Lake Plant meters.

Despite the success of the I/I mitigation work and heavy effort undertaken by our team and surrounding communities to repair and maintain sewer infrastructure, climate change has the potential to impact these mitigation efforts. Recently, we published our Climate Action Work Plan with a commitment to “Evaluate the impacts of climate change on inflow and infiltration to the regional wastewater collection system and develop recommendations to respond accordingly” (Metropolitan Council, 2022). Changing precipitation patterns may stress the regional collection system and could lead to increasing issues with I/I. Another consideration related to climate change is the potential for rising groundwater levels, potentially inundating pipes that were originally above the groundwater table. With the uncertainty of climate change

impacts, it is important to plan for these changes and work to mitigate the issues as much as possible.

Private property I/I mitigation

Sources of I/I from private property include flow from uncapped sewer cleanouts, improperly connected sump pumps, improperly connected gutters, and cracks in sewer lateral pipes (**Figure 4**). The EPA has estimated that about 40% of I/I originates from private laterals (EPA, 2014). In their 2040 comprehensive plans, local communities in the metro area estimated that overall, at least half of all I/I comes from private property sources. Little work has been focused on private property I/I. This is primarily due to a lack of dedicated and reliable funding sources to incentivize this work. Entry into a private residence or business adds to the legal and political challenges that private property I/I work poses for local communities. The 2005 task force determined that the cost of building additional capacity and peak flow storage facilities in both the interceptor and treatment systems to accommodate I/I from private property sources would cost, in 2020 dollars, approximately $1.45 billion, whereas the cost to mitigate I/I at its source was estimated at $240 million (Metropolitan Council Environmental Services, 2005). In an effort to address private property I/I sources, the 2016 I/I Task Force included in its recommendations that the Council "Seek statutory authority to allow the Metropolitan Council to provide financial assistance through communities to assist private property owners with I/I mitigation activities using revenues generated by wastewater fees."

In 2022, Minnesota Statutes section 471.342 was amended to give cities, townships, and political subdivisions with statutory sewer ownership or operational responsibilities authority to use revenue generated by user fees to fund private property I/I grants for property owners. This statute gives any sanitary district within Minnesota the authority to fund private property I/I grant programs, including the Met Council. As a response, we will convene an I/I Task Force of city and township staff representatives to assist in developing an effective private property I/I grant program. It is anticipated that grant applications would be solicited in January 2024. This task force will explore how equity can be incorporated into the grant distribution. Our current regional development plan, Thrive MSP 2040, lists equity as an outcome voiced by the region's residents, cities, nonprofit and business leaders. The plans and policies that balance equity, with other Thrive MSP 2040 outcomes, will create positive change that supports the vision of a prosperous, equitable, and livable region.

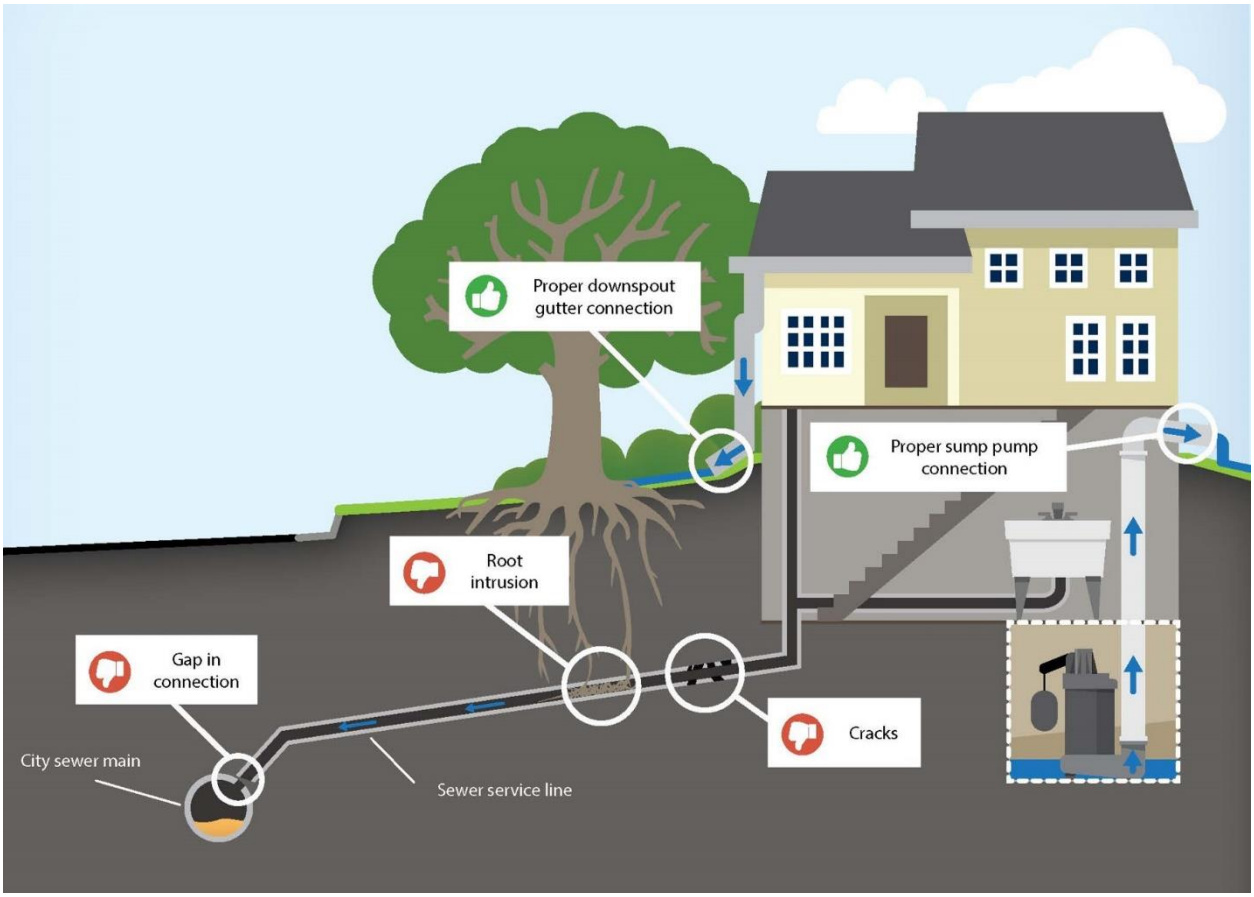


Figure 4: Sources of I/I from private property

Inflow and Infiltration recommendations

It is recommended to modify the existing policy and include the bolded words:

*"The Council will not provide additional capacity within its **interceptor and treatment systems** to serve excessive inflow and infiltration.*

The Council will establish inflow and infiltration goals for all communities discharging wastewater to the regional wastewater system. Communities that have excessive inflow and infiltration in their sanitary sewer systems will be required to eliminate the excessive inflow and infiltration within a reasonable time period."

Proposed supporting actions to support I/I mitigation are below. The Met Council will:

- Continue to support, advocate, and coordinate with Metro Cities for state bond funding for municipal public system I/I grants.

- Advocate for dedicated and reliable funding for private property inflow and infiltration mitigation and pursue grant program recommendations from the 2023 Private Property Inflow and Infiltration Task Force.
- Consider direction from the Climate Action Work Plan when considering climate impacts on inflow and infiltration.

Vactor waste receiving

Vactor waste is defined as solids removed from sanitary sewer facilities, most often during cleaning operations. Materials in vactor waste typically include grit, sludge, debris, fats or grease, and rags (such as wipes, textiles and diapers). Some industrial loads are also allowed. Vactor waste does not include waste generated by storm sewer cleaning, hydroexcavation, or liquid wastes such as septage from portable toilets.

Currently, we offer vactor waste disposal at only the Metropolitan Wastewater Treatment Plant. Cities, private haulers, and our team in Environmental Services all discharge vactor waste at this location. However, during flood conditions, this site is closed. Potential implications include:

- Not meeting customer needs for waste disposal and treatment
- Vactor waste being disposed in other areas of the regional collection system or local system (leading to issues with grit accumulation, causing backups or spills)
- Need for Environmental Services agreements with other cities for disposing during flood conditions (i.e., Apple Valley and Saint Louis Park)
- Use of the 3rd & Commercial facility located near the Metro Plant for emergency Environmental Services vactor waste disposal (not intended to be a vactor waste disposal site)

Both wet and dry loads of vactor waste can only be disposed of at the Metro Wastewater Treatment Plant. This is due to grit issues at our other locations. During flood conditions, the site is closed, requiring haulers to hold waste until the Metro Wastewater Treatment Plant opens or bring the waste to another locally operated location, often further away. Additionally, not having access to the Metro Wastewater Treatment Plant during flood conditions increases the likelihood of an illegal discharge to the regional or local collection system.

Other cities throughout the metro region have their own facilities for vactor waste disposal, however, the location, number, and types of facilities is not known because we only require permits for vactor waste disposal to MCES-owned facilities. They include Apple Valley, Minneapolis, New Hope, and Saint Louis Park.

During flood conditions, we have disposed of vactor waste at both the Apple Valley and Saint Louis Park's facilities. In emergency situations, we also have used the 3rd & Commercial liquid waste receiving site although this is not ideal, as the site was not designed or intended to be a vactor waste disposal facility. Vactor waste haulers for cities and contractors do not have emergency access to the 3rd & Commercial site.

The City of Saint Paul has expressed concern regarding lack of access to the Metro Plant and the 3rd & Commercial site during river flood conditions.

Previous 5th & Kittson vactor waste site

Prior to its closure in 2011, vactor waste was accepted at our 5th & Kittson facility. The facility was closed due to grit build-up, which was a constant issue at the site.

2021-2022 Vactor waste survey

A survey was conducted in 2021-2022 to better understand the needs of individual municipalities and how they are currently handling vactor waste, the number and location of locally owned disposal sites, and any issues related to disposal. Surveying municipalities as well as private haulers was the first step toward assessing vactor waste needs for the region. A mapping effort and inventory update is underway for our vactor waste sites, liquid waste receiving sites, and city-owned sites. The survey effort also compiled information on vactor waste permitting, which is handled by our Industrial Waste group through the Waste Discharge Rules, permitting, and load fees. As of 2022, there are 57 vactor waste permittees, excluding our trucks. The 2022 annual Metro Wastewater Treatment Plant vactor waste site usage is summarized below:

- Wet site usage – 1,004,722 gallons
- Dry site usage – 1,650 cubic yards
- 984 total loads

The survey effort included information on our coordination with municipalities on local vactor waste sites, including assisting with the cost of building a vactor waste site accessible for our Environmental Services use in the city of Saint Louis Park.

The results of the survey included comments by private haulers expressing a desire to haul vactor loads from outside the metro area to our facilities for disposal.

Our previous efforts to understand and address vactor waste disposal needs include:

- 2010 Brown and Caldwell Tech Memo (Keegan, T., 2010)
    - Investigated vactor waste treatment methods and proposed several possible new vactor waste disposal sites throughout metro area
    - Received few responses from cities (seven in the metro area)
    - Proposed sites in Fridley, Oakdale, Lakeville, and Mound (Fridley became a liquid waste receiving facility)
- Vactor Waste Permit process developed through Industrial Waste
    - Better regulates vactor disposal and provides a mechanism for recovering disposal costs
    - 89 permitted haulers as of 2020
- 2014 Environmental Services Survey of local vactor waste needs

- 11 responses

Future work is recommended to finalize the mapping effort and inventory update, and to work towards a needs assessment and siting study, feasibility study for design requirements, participation agreements if applicable, and scope for construction.

Vactor waste receiving recommendations

Conversations with vactor waste customers have been ongoing to better understand their needs and concerns. An ongoing concern for both Environmental Services and customers is waste disposal during river flood conditions when the Metro Plant is inaccessible. Not having access to the Metro Plant during flood conditions or having to travel long distances to a locally owned disposal sites increases the potential for illegal discharges and issues in the conveyance system including debris accumulation.

Liquid waste receiving

We actively support five liquid waste receiving facilities, with a sixth maintained as a backup site (**Figure 5**). Liquid wastes accepted by these facilities include domestic waste (septage and holding tank), commercial waste (portable toilet, grease trap, flammable wastewater, sand trap, commercial holding tank), and industrial waste (waste by-products, landfill leachate, contaminated waters).

We eliminated five disposal sites before or during 2009. The sites were in Brooklyn Park. Chanhassen, Coon Rapids, Forest Lake, Plymouth, and. Interceptor flows in those areas were not sufficient to carry the hauled material downstream, requiring significant funding to remove the material. Now, we only provide disposal sites with screening and de-gritting units that can remove solids (Blue Lake, Empire, Metro, and Seneca) wastewater treatment plants and a site in Fridley).

Many rural treatment facilities have also discontinued the acceptance of this material, limiting disposal options. Waste haulers, particularly in the western metro, have expressed concerns over the decreasing number of disposal sites. As sites close, haulers may need to drive further distances to dispose of the waste. If we were to add another liquid waste receiving site, location and costs would need to be considered to mitigate any burdens on those around the new facility.

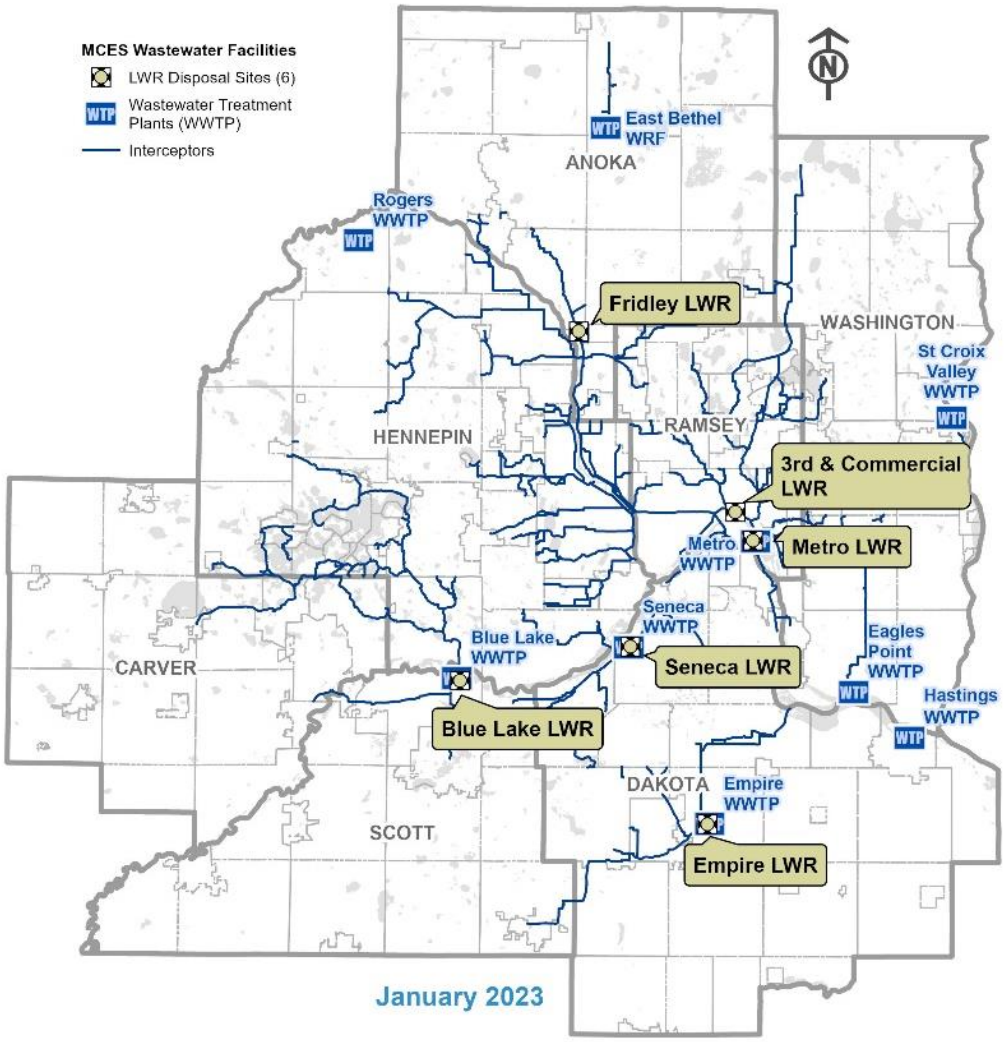


Figure 5: Metropolitan Council Environmental Services liquid waste receiving sites

Liquid waste receiving recommendations

Liquid waste receiving sites are addressed in the implementation action in the policy on Serving the Rural Area. Suggested policy edits are in bold below:

"The Met Council will acquire wastewater treatment plants owned by Rural Centers, based upon their request through the comprehensive plan and comprehensive sewer plan processes, ***if the requested acquisition:***

- ***Provides cost-effective service***
- ***Accommodates assigned growth***

- ***Protects public health and wellbeing***
- ***Currently meets or, with improvements can meet, environmental and regulatory requirements.***

In addition, customer input must be solicited and a public hearing on the request must be conducted."

Proposed supporting actions to support liquid waste haulers and rural areas are that the Met Council will:

- Consider providing a higher level of service for liquid waste haulers by investigating adding and maintaining liquid waste receiving sites.
- Partner with state agencies to discuss subsurface sewage treatment system disposal facilities and rural access to disposal sites.

Requested acquisitions of rural wastewater treatment plants

Communities in the metro area fall under either the Metropolitan Urban Service Area or the Rural Service Area. The Rural Service Area includes land uses like small towns, farmlands, hobby farms, woodlands and natural resources, and open spaces. The Rural Service Area is divided into four community designations in **Table 3**.

Table 3: Rural community designations

Community Designation	Description	Density
Rural Center	Local commercial, employment, and residential activity centers serving rural areas in the region. These small towns are surrounded by agricultural lands and serve as centers of commerce to surrounding farmlands.	3-5 units/acre
Rural Residential	Communities with residential patterns characterized by large lots and no plans to provide urban infrastructure.	Maximum allowable density is 1 unit/2.5-acres
Diversified Rural	Communities with a variety of farm and nonfarm land uses, including large lot residential, clustered housing, hobby farms,	Maximum allowable density is 4 units/40 acres

	and agricultural uses. Located adjacent to the Emerging Edge Suburban communities, the Diversified Rural designation protects rural land for rural lifestyles today with the potential of becoming urbanized after 2040.	
Agricultural	Communities encompassing areas with prime agricultural soils that are planned and zoned for long-term agriculture.	Maximum allowable density is 1 unit/40 acres

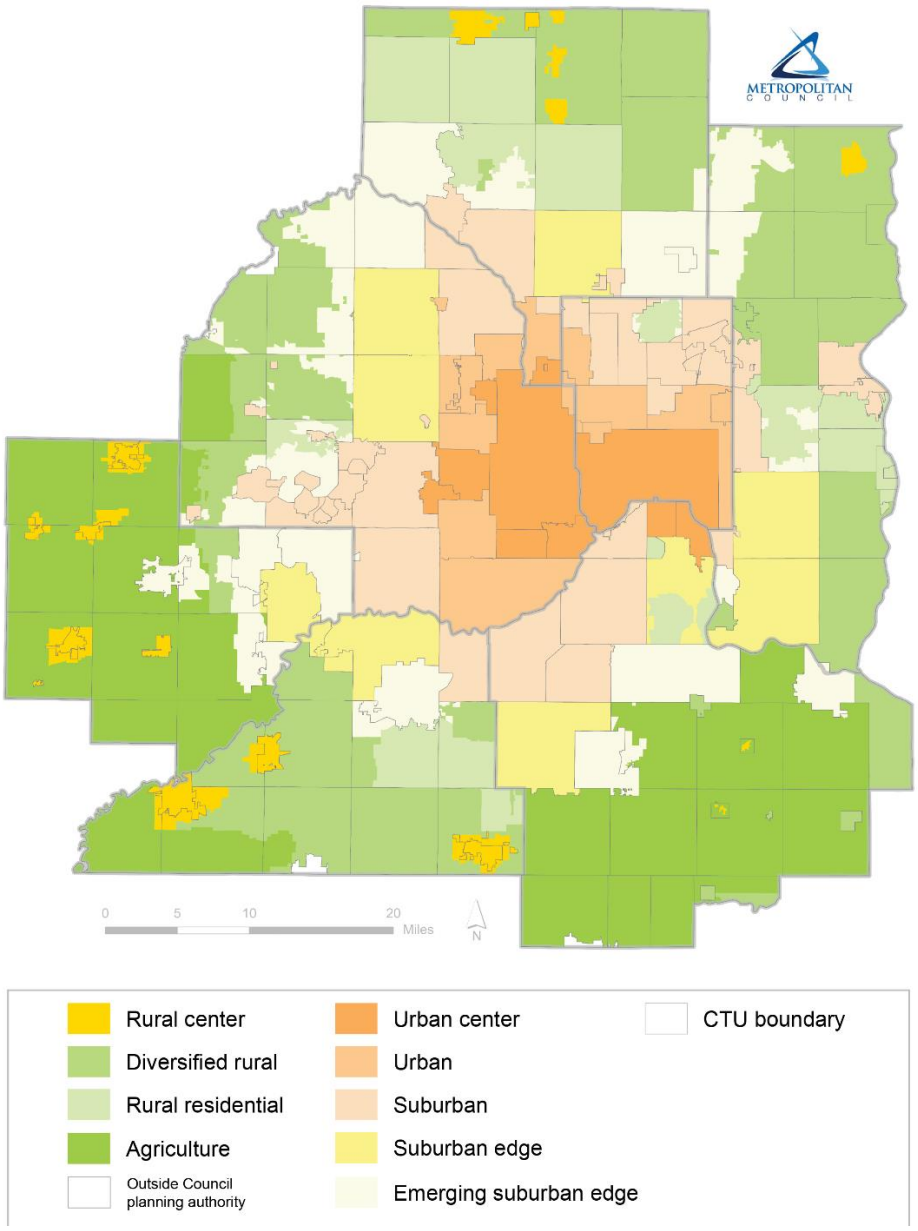


Figure 6: Thrive MSP 2040 community designations

In the past, some Rural Centers have wanted us to acquire their wastewater treatment plant to accommodate local growth and assist in maintaining or improving existing infrastructure. It is possible we will receive more requests in the future as existing facilities reach capacity or when more stringent regulatory requirements make improvements too costly for the city or township. Rural Centers request our acquisition through the comprehensive plan and comprehensive sewer plan processes. Minnesota Statutes section 473.511 authorizes us to acquire wastewater treatment facilities. The 2040 Water Resources Policy Plan guides the policy and process for the requested acquisition. The current criteria for acquisition include:

- The community accepts the Metropolitan Council's growth forecasts and preserves at least 1,000 developed or developable acres for growth through the land use planning authority of the county or adjacent township(s) or through an orderly annexation agreement or similar mechanism to provide for staged, orderly growth in the surrounding area.
- The community has a DNR-approved water supply plan.
- The community has adequate transportation access.
- The community lies within the long-term wastewater service area (Figure 6) or other regional benefits would result from the acquisition, such as economic development unique to the rural area or preservation of high-value water resources.
- There are feasible and economical options for siting and permitting an expanded wastewater treatment plant, or for extending interceptor service.
- The Metropolitan Council has sought customer input, has conducted an appropriate financial analysis, and has held a public hearing on the community's acquisition request.

In considering and implementing an acquisition request, we at the Metropolitan Council will also:

- Convene a work group of urban customer representatives to advise the Metropolitan Council regarding growth-forecast uncertainty, transportation to support the growth forecast, and the identifiable regional benefits.
- Require that, if the most economical and beneficial wastewater service option is to construct a regional interceptor to serve the community, the Metropolitan Council will not acquire the community's wastewater treatment plant, and the community will be responsible for decommissioning its treatment plant.
- Not allow connections to the regional wastewater system outside the sewered rural community. The Metropolitan Council may construct capacity to serve the long-term needs of the rural and agricultural planning areas, but will not provide service until the Metropolitan Council, in consultation with the appropriate community, designates the area as a developing community and the community amends its comprehensive plan accordingly.
- Preserve areas outside the long-term wastewater service area for agricultural and rural uses, while protecting significant natural resources, supporting groundwater recharge, protecting source-water quality, and allowing limited unsewered development.

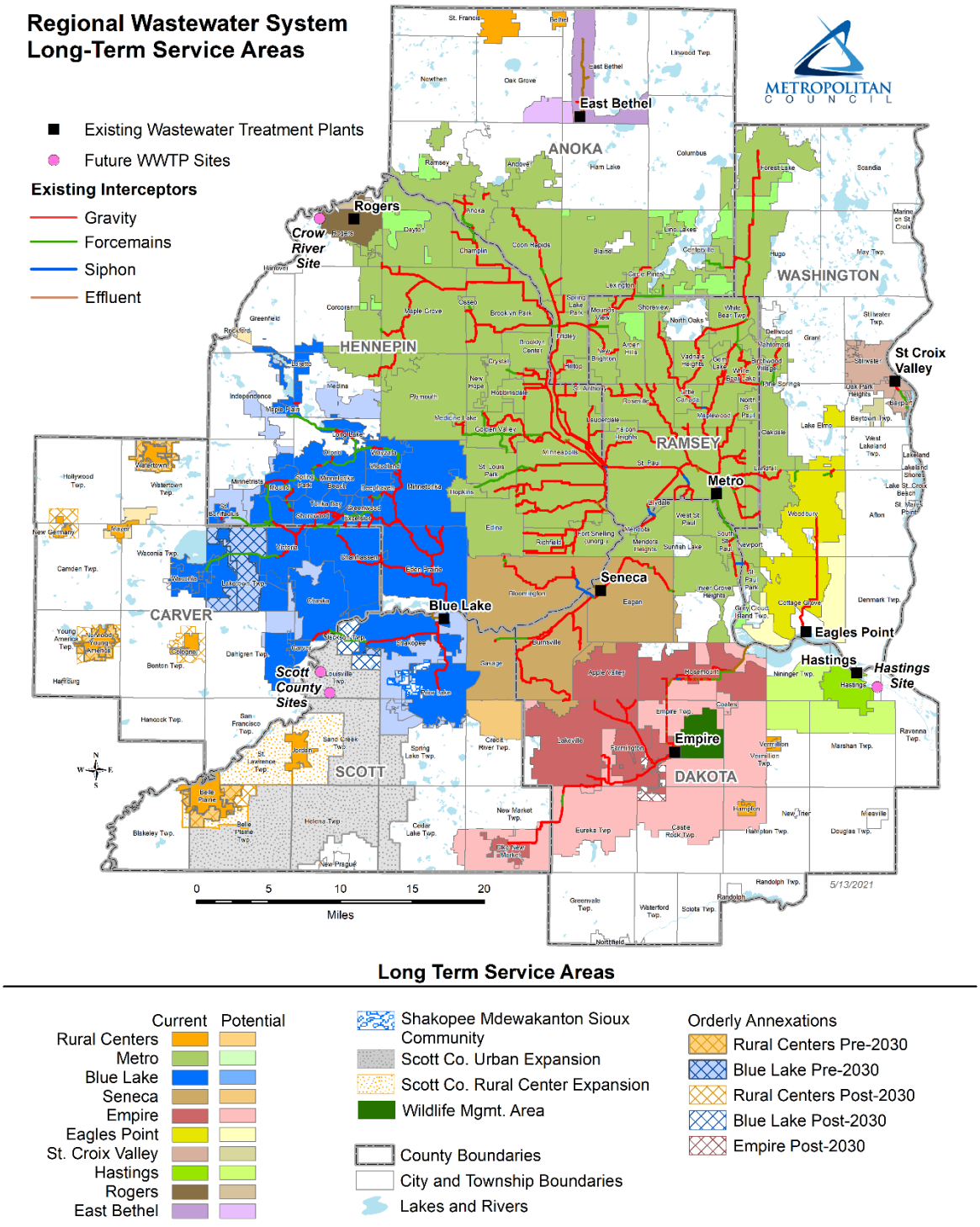
There are treatment plants in the metro area that are municipally owned and operated, shown in

Table 4.

Table 4: Municipal wastewater treatment plants in the metro area

City or Township	Design capacity, million gallons per day average (wet weather)	Design capacity, million gallons per day average (dry weather)	Receiving water	Permitted effluent limits
Afton MN0070599	0.051	N/A	Groundwater	BOD, TSS, NH_3
Belle Plaine MN0022772	0.840	0.400	Minnesota River	BOD, FC, pH, TP, TSS
Bethel MN0058475	0.038	0.031	Groundwater	BOD, TSS
Cologne	0.325	0.185	Ditch to Lake Benton	BOD, TP, TSS
Greenfield MN0063762, IND20190001	0.200	0.150	Crow River	BOD, pH, TP, TSS
Hamburg MNG585386	0.063	N/A	Ditch to Bevens Creek (to Minnesota River)	BOD, TSS
Hampton MN0021946	0.101	N/A	Ditch to Vermillion River	BOD, FC, pH, TP, TSS
Jordan MN0020869	1.289	0.580	Sand Creek (to Minnesota River)	BOD, NH_3, TP, TSS
Mayer MN0021202	0.435	0.320	South Fork Crow River	BOD, FC, Hg, NH_3, DO, pH, TP, TSS (salty discharge monitoring)
New Germany MN0024295, IND20200001	0.520	N/A	Ditch to South Fork Crow River	BOD, FC, pH, TP, TSS
Norwood Young America MN0024392, IND1000001	0.908	0.517	Ditch to Bevens Creek (to Minnesota River)	BOD, TSS
St. Francis MN0021407, IND20190001	0.814	0.647	Seelye Brook	BOD, Cl-, TRC, FC, Hg, NH_3, pH, DO, TP, TSS. Reuse: E. Coli, Turbidity,

Vermillion	0.054	N/A	Ditch to Vermillion River	BOD, TRC, FC, DO, pH, TP, TSS
Watertown MN0020940	1.262	0.362	Crow River, South Fork Crow River	BOD, Cl- (15 yr plan), TRC, FC, NH3, pH, TP (0.53/0.25 mg/L RES limit), TSS



Long Term Service Areas

	Current	Potential
Rural Centers		
Metro		
Blue Lake		
Seneca		
Empire		
Eagles Point		
St. Croix Valley		
Hastings		
Rogers		
East Bethel		

- Shakopee Mdewakanton Sioux Community
- Scott Co. Urban Expansion
- Scott Co. Rural Center Expansion
- Wildlife Mgmt. Area
- County Boundaries
- City and Township Boundaries
- Lakes and Rivers

Orderly Annexations
- Rural Centers Pre-2030
- Blue Lake Pre-2030
- Rural Centers Post-2030
- Blue Lake Post-2030
- Empire Post-2030

Figure 7: Long term service areas of the Twin Cities metropolitan area

Financial implications

Municipal wastewater charge (MWC)

The Met Council allocates current costs of operation, maintenance, and debt service to the local government units which discharge wastewater directly or indirectly into the Metropolitan Disposal System (Minn. Stat. § 473.517, subd. 1). A local government's MWC is based on its total flow volume compared to the total regional flow. The local government's portion is then applied to the total MWC budget to determine their total annual MWC, which is billed each month in 12 equal amounts.

Depending on flow conditions and volume, we may install a meter to measure the city or township's flow. If flow is estimated, a correction method will be established between us, the city or township generating flow, and the city or township receiving the flow.

Sewer availability charge (SAC)

SAC is a one-time fee that we charge local governments when a residential, commercial, industrial, or institutional property connects to the regional wastewater system. SAC is also charged if a business changes and creates more potential demand on the wastewater system. We charge SAC to local governments, who pass it on to business or property owners. We borrow money to build infrastructure large enough to serve current and future customers, and SAC is used to help pay off the debt (Minn. Stat. § 473.517, subd. 3).

Our current policies state that SAC will be uniform within the urban area based on capacity-demand classes of customers and the SAC Procedure Manual. These costs are currently allocated to municipalities based on the number of residential equivalent SAC units connecting either directly or indirectly to the Metropolitan Disposal System. Local governments are liable for these charges and can pay themselves or collect the amount from the property owner.

Prior to a requested acquisition, the local government provides an inventory of all existing buildings and properties being served by current treatment infrastructure to determine an amount of SAC that already exists, or what can be grandparented, or carried over to new development. Only properties that have sewer service available to the building are grandparented for SAC credit purposes. Vacant buildings are eligible for grandparent if there is sewer service available to the building, but vacant and greenfield properties are excluded from grandparent credit.

Grandparent SAC is retained as a property-specific credit for future use. If property use changes result in an increase in the required SAC, the retained grandparent SAC credits can be used to offset charges for the property. Following a change in property use, any property-specific balances of the grandparent SAC will expire if unused after five years. If the connection to the regional wastewater system is eliminated, any residual site-specific grandparent SAC credits expire.

Requested acquisition costs

When we assume ownership of any existing interceptor or treatment works, the governmental unit, which has paid for part or all the costs of the facility, will be compensated for the current value of the treatment works (Minn. Stat. § 473.511, subd. 4 provides a detailed formula for determining the appropriate cost).

Capital improvement costs

Upon acquisition, we may need to implement capital improvements to bring the facility to regional standards. These improvements may include various process or safety upgrades, metering and telemetry improvements, or other enhancements.

Annual operations and maintenance costs

We will be responsible for paying operations and maintenance costs associated with operating the facility, including staffing, materials and supplies, chemicals, utilities, and more.

Other considerations

Plant transition period and employment

Wastewater treatment facilities require continuous operation. The acquisition period may bring challenges to staff unfamiliar with the new facility. Therefore, the local government will work with our team to collaboratively develop a transition plan that will be executed during a defined joint operations period. The plan will recognize parties responsible for day-to-day operations, training, and emergency response. During the joint operations period, both local government and our staff need 24-hour access to the treatment works.

Before the transition date, the local government will transfer or assign all regulatory permits required for the operations and maintenance of the facility, along with contracts for utilities, trash hauling, chemicals, and any other contracts, reports, and regulatory filings related to the treatment works.

Future service

Whether acquiring an existing treatment works or providing service to a currently un-serviced area, our team considers several factors in determining the most successful and cost-efficient option to service the new area. Where possible, current infrastructure such as existing treatment works and interceptor lines are utilized if in good operating condition and of adequate capacity. Similarly, we consider cooperating with surrounding municipalities to utilize local infrastructure. Both options may delay costly improvements.

If a new treatment works is needed, input is acquired through a public hearing process. Additionally, we consult the 11 federally recognized tribal nations of Minnesota. Real estate will likely need to be acquired for interceptor lines and the new plant site. If a current treatment works is replaced, we negotiate who will pay for the decommissioning of the facility and the guidelines of such decommissioning. In most cases, the real property upon which the current plant is sited is acquired by us at no cost. We assess how much property is needed to provide wastewater service and any property not needed is transferred back to the local government.

If a new treatment works is necessary, we consider a variety of factors in planning the facility. A careful inventory of the future wastewater service level needs of the area is completed to determine plant and pipe capacities. Regulatory requirements and discharge body of water helps guide the necessary treatment technology. Similarly, we consider water supply needs for the area to determine if a water reclamation facility is appropriate. A water reclamation facility would treat wastewater to a standard where it could be reused for a variety of purposes, like irrigation and industrial reuse, before discharging back into the environment.

Regional benefit

We want both the regional system and the local system to benefit if a rural treatment works is acquired. Rural Center SAC rates are higher when compared to other communities because, per the SAC Procedure Manual, those rural SAC rates pay for the reserved capacity portion of the debt service specifically for the new treatment works. A case-by-case analysis must be performed for each requested acquisition to determine the environmental and public health benefits to the local and regional systems, among other factors.

Direction of the regional system is an ongoing conversation (see the section titled, Centralized and Decentralized Wastewater Planning). Depending on whether the support is for a centralized or decentralized system, the option for rural service would either be to acquire the rural treatment works or convey to the existing regional disposal system.

Acquisition of Rural Wastewater Treatment Plant Recommendations

Acquisition requests of rural wastewater treatment plants are addressed in the policy on Serving the Rural Area. We recommended modifying the current policy on Serving the Rural Area as suggested in bold below:

"The Met Council will acquire wastewater treatment plants owned by Rural Centers, based upon their request through the comprehensive plan and comprehensive sewer plan processes, ***if the requested acquisition:***

- ***Provides cost-effective service***
- ***Accommodates assigned growth***
- ***Protects public health and wellbeing***
- ***Currently meets or, with improvements can meet, environmental and regulatory requirements.***

In addition, customer input must be solicited and a public hearing on the request must be conducted."

The acquisition request process is defined in statute. Environmental Services require certain conditions to be met before a plant can be acquired. This is explained further in the policy implementation actions. Each acquisition request process is different.

Contaminants of regulatory concern

The 2040 Water Resources Policy Plan specifically addressed two pollutants of regulatory concern in the Wastewater System Plan: phosphorus and nitrogen.

The Minnesota Pollution Control Agency (MPCA) develops regulatory structure for contaminants. Of interest to this paper are phosphorus, nitrate, ammonia, total nitrogen, sulfate and per- and polyfluoroalkyl substances (PFAS) compounds. The phosphorus regulatory structure for point-sources has been developed, and implementation is well underway at municipal and industrial wastewater treatment plants through the National Pollutant Discharge Elimination System and State Disposal System (NPDES/SDS) permitting program. Nitrate, ammonia, and total nitrogen issues are in the policy, technical review, development and fully developed stages at MPCA. In 1973, Minnesota adopted a sulfate standard to protect wild rice based on studies showing that wild rice was found primarily in low sulfate waters. On May 24, 2023 MPCA announced that they will begin implementation of the standard in NPDES permits during renewals. This paper will address these containments with regulatory concerns highlighted and a brief discussion of other contaminants with a lesser potential impact to the wastewater treatment plant system operations.

Regulatory standards are enacted to protect aquatic life, human health, and air quality. They must be met by the wastewater treatment plant that discharges to that body of water or in that airspace. Therefore, we are concerned with and follow many standards that have been enacted for various reasons.

Nitrogen and phosphorus

The Minnesota Nutrient Reduction Strategy set nitrogen and phosphorus reduction goals for wastewater treatment plants (MPCA, 2014a). The reduction goals are as shown in Figure 8Figure 8.

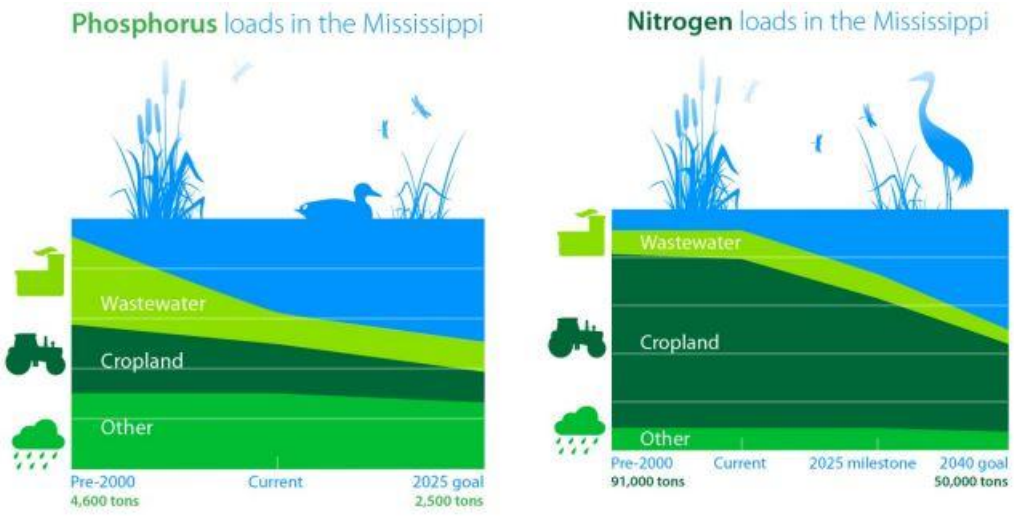


Figure 8: Nutrient reduction goals

Phosphorus and Nitrogen reduction goals from the Minnesota Nutrient Reduction Strategy (MPCA, 2014b)

The Minnesota Pollution Control Agency has communicated that it plans for wastewater treatment plants to contribute to the overall nitrate reduction goal of 45% from average 1980 – 1996 conditions (MPCA, 2014a). This goal may not be fully attainable via a nitrate water quality standard. We expect the MPCA to further develop a Nitrogen Reduction Strategy Plan for wastewater treatment plants to provide guidance for continued nitrate reduction.

MPCA has begun work on a Minnesota nitrate water quality standard, but the process is not complete. The published draft nitrate standard for Class 2 waters will likely not affect our treatment plants, as shown by the Minnesota Pollution Control Agency analysis of the possible impact on our operations in the Fall of 2022.

While nonpoint sources like agriculture are the primary source of nitrogen loading, wastewater treatment plants have some contribution to nitrogen loading through effluent discharge to water bodies. It is possible that future regulatory action may prompt additional treatment upgrades to further reduce nitrogen discharges from wastewater treatment plants. Ten years ago, we estimated it to cost approximately $1-2 billion to add nitrogen removal technology to our current wastewater treatment system if a proposed nitrate water quality standard of 3-6 mg/L was enacted. While the current draft nitrate water quality standard may not impact our WWTPs, we will need to determine our response to the evolving MPCA Nutrient Reduction Strategy.

Phosphorus concerns have been addressed at most of our wastewater treatment plants. Lake Pepin is the downstream water body for all currently operational wastewater treatment plants and has a total maximum daily load limit completed and approved by the Environmental Protection Agency. All our wastewater treatment plants have annual and daily loading limits, specified in the Lake Pepin total maximum daily load, and have been incorporated into eight of the nine NPDES permits.

The work of the wastewater sector has had a dramatic decrease in total phosphorus effluent, as seen in Figure 9.

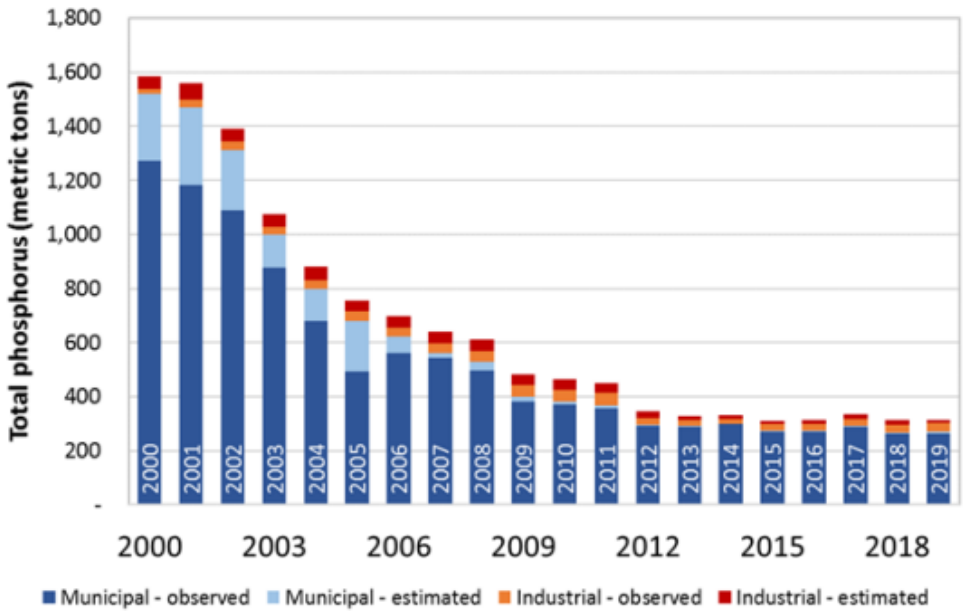


Figure 9: Annual NPDES wastewater phosphorus loads
Municipal and industrial facility loads in the Lake Pepin Watershed (MPCA, 2021)

Our wastewater treatment plants were early adopters in supporting the phosphorus portion of the Nutrient Reduction Strategy and its more stringent regulatory vehicle, the Lake Pepin TMDL. We have taken an estimated 70% reduction in permitted total phosphorus levels since 2010. Most of our wastewater treatment plants now have biological phosphorus removal systems and can consistently meet the lower total phosphorus limits. Two important regulatory strategies were developed during this time:

- Total phosphorus concentration limits can be expressed as a 12-month moving average rather than a monthly average.
- The Mississippi Basin total phosphorus permit combines total phosphorus loading limits for five wastewater treatment plants into one permit. This permit recognizes the nature of nutrient pollution transport versus toxic pollution at an outfall.

The Blue Lake Wastewater Treatment Plant will be the last to incorporate new total phosphorus limits into its permit. Because of its large size, the Council anticipates it will be required to meet a low loading standard, developed from a 0.3 mg/L total phosphorus concentration. These loading limits will become more difficult to meet as flow increases.

Another future challenge will be that the total phosphorus loading limit specified in the total maximum daily load will remain constant even if a wastewater treatment plant expands its capacity. We are currently preparing and planning for these reductions for the Blue Lake and Rogers Wastewater Treatment Plants which will involve capital investment to make the necessary operational changes.

Phosphorus river eutrophication standards are being incorporated into permits during renewals. Wastewater treatment plants will be expected to maintain the effluent at 50% of the permitted river eutrophication standard limits through the months of June to September.

The Rogers Wastewater Treatment Plant discharges to the North Fork of the Crow River. The total phosphorus river eutrophication standard limit for that river is more stringent than the annual loading limits described in the Lake Pepin total maximum daily load and will impact the Rogers Wastewater Treatment Plant as it expands. The Minnesota, Mississippi and St. Croix Rivers have river eutrophication standard limits similar to Lake Pepin's total maximum daily load limits.

Ammonia

Minnesota has a statewide ammonia water quality standard and limits are added to the NPDES/SDS permits during renewals. An updated ammonia water quality standard was issued in 2022 and is in the rulemaking process. Currently, we do not expect significant changes to permitted limits for ammonia, but limits are expected to tighten and may have some impact to our future wastewater treatment plant permits.

PFAS (Per- and polyfluoroalkyl substances)

PFAS are synthetic chemicals that have been manufactured since the 1940s. They are found in many different consumer, commercial, and industrial products. Water bodies receive these compounds from contamination, industry, and households.

There are over 9,000 different PFAS compounds. One of them, perfluorooctane sulfonic acid (PFOS), was manufactured by 3M in the Minneapolis/Saint Paul Metro area from the late 1940's until 2010. It has been found in the environment with hot spots of higher concentrations in ground and surface water worldwide, including the metro area. Known PFOS impacted areas near our operations include the lower portion of Pool 2 of the Mississippi River near the 3M manufacturing facility outfall, the Pigs Eye Dump (where PFAS waste products were dumped), and Lake St. Croix (which has also been impacted by landfills in the East Metro area).

Two of the earliest developed and most studied types of PFAS, PFOS and perfluorooctanoic acid (PFOA), are no longer manufactured in the USA and assessment and clean-up has begun. Newer PFAS chemicals are now manufactured and used in place of these older chemicals in some applications.

Because of the widespread distribution and persistence of PFAS, and toxicity of PFOS and PFOA, regulations are being developed to protect human health and ecological systems. We expect all our wastewater treatment plants to be impacted in some manner by emerging PFAS regulations. The current focus of developing wastewater regulations is PFOS and PFOA. In addition to wastewater regulations, high public concern and both political and regulatory action in Minnesota and across the country should be expected.

PFOS and PFOA monitoring in Minnesota

PFOS and PFOA have had Minnesota site specific water quality criteria associated with the Metro, Empire and Eagles Point Wastewater Treatment Plant outfalls since 2013. Prior to 2020, these effluents did not cause the receiving water body, Pool 2 of the Mississippi River, to have reasonable potential to exceed specific water quality criteria for that area, and no permit limits were assigned to those wastewater treatment plants. In 2013, the Empire Wastewater

Treatment Plant had one sample for PFOS in the effluent near the PFOS standard and as a result has a required PFAS reduction plan in its the NPDES/SDS permit.

The Minnesota PFOS site specific water quality criteria to protect human health was significantly lowered in 2020 (**Table 5**). Minnesota's PFOS water quality criteria is among the lowest in the nation. This water quality criteria change creates the possibility of permit limits or other regulation at several wastewater treatment plants (Metro, Empire, Eagles Point, and St. Croix Valley).

Table 5: Minnesota site specific human health-based water quality criteria (MPCA, 2007)

	2013 – water column, ng/L*	**2020 – water column, ng/L***	**Water bodies impacted**
PFOS	Pool 2 - 14 Bde Maka Ska - 6.1	0.05	Pool 2/Bde Maka Ska – calculated from site specific information in 2013. In 2020 new water bodies added, water quality criteria not calculated at specific site.
PFOA	Pool 2 – 651 Bde Maka Ska 720	No update	Pool 2/Bde Maka Ska – calculated from site specific information

* ng/L – nanogram per liter

The other MCES wastewater treatment plants are following Minnesota's PFAS Wastewater Monitoring Plan (MPCA, 2022) and do not currently discharge into waters subject to a water quality criteria or standard. That could change, as the MPCA has announced it is planning to adopt a statewide PFOS water quality standard for human health in the future. PFAS regulation is rapidly evolving and there is the potential for all MCES WWTPs to be subject to PFAS permit limits or other regulation in the future.

As of 2022, there are no human health PFAS water quality criteria at the federal level. The Environmental Protection Agency announced a draft aquatic life water quality criterion for PFOS and PFOA (**Table 6**, USEPA, 2022). Our wastewater treatment plants meet all the Environmental Protection Agency draft water quality criteria for aquatic life.

Table 6: EPA draft recommended freshwater aquatic life water quality criteria for PFOA and PFOS

Criteria Component	**Acute Water Column (CMC)[1]**	**Chronic Water Column (CCC)[2]**	**Invertebrate Whole-Body**	**Fish Whole-Body**	**Fish Muscle**
PFOA Magnitude	49 mg/L	0.094 mg/L	1.11 mg/kg ww	6.10 mg/kg ww	0.125 mg/kg ww
PFOS Magnitude	3.0 mg/L	0.0084 mg/L	0.937 mg/kg ww	6.75 mg/kg ww	2.91 mg/kg ww
Duration	1-hour average	4-day average	Instantaneous[3]		

Frequency	Not to be exceeded more than once in three years, on average	Not to be exceeded more than once in three years, on average	Not to be exceeded more than once in ten years, on average

[1]Criterion Maximum Concentration

[2]Criterion Continuous Concentration

[3]Tissue data provide instantaneous point measurements that reflect integrative accumulation of PFOA or PFOS over time and space in aquatic life populations(s) at a given site.

Biosolids

We produce over 100,000 dry tons of biosolids per year. A large portion is used to generate heat and electricity through incineration at the Metro Wastewater Treatment Plant. Another portion is processed at the Blue Lake and Empire Wastewater Treatment Plants in facilities that anaerobically digest the sewage sludge to use on farm fields as fertilizer. Biosolid use on farm fields can improve soil health, improve drought tolerance, promote plant growth, and reduce the need for commercial fertilizers. We follow quality standards and best management practices set by the Environmental Protection Agency and Minnesota Pollution Control Agency in our Land Application Program (Metropolitan Council, n.d.). Only limited amounts of this resource are landfilled.

The Environmental Protection Agency is developing a risk analysis process for PFAS in biosolids. The risk analysis could eventually lead to regulation of PFAS in biosolids and ash.

Air quality

The current PFAS air quality data is limited, and analytical methods are not fully validated at this time. We expect Minnesota to require reporting of PFAS in air beginning April 2024. We do complete the voluntary air toxics reports for wastewater treatment plant sites with air permits. In the future, some PFAS chemicals may be added to the Federal Hazardous Air Pollutant List and included in air quality permitting.

Drinking water

Minnesota has health-based values for six PFAS compounds including PFOA and PFOS (**Table 7**). The Environmental Protection Agency announced health advisories for four PFAS compounds on June 15, 2022 (EPA, 2022) and proposed drinking water regulations March 14, 2023. Both the Minnesota health-based values and the EPA health advisory are non-regulatory values.

The EPA advisories and proposed standards for PFOS and PFOA are significantly lower than the Minnesota health-based values. The Minnesota Department of Health will be reviewing whether changes to existing health-based values are needed.

Table 7: Minnesota health-based values - PFAS

PFAS Chemical	Minnesota Drinking Water Guidance Value (parts per billion)	EPA - interim, drinking water health advisories (parts per trillion)	EPA – Proposed Safe Drinking Water Standards – March 2023 (parts per trillion)
PFBS	0.100	2000	1.0 Hazard index
PFHxS	0.047	--	1.0 Hazard index
PFOS	0.015	0.020	4
PFBA	7.000	--	1.0 Hazard index
PFHxA	0.200	--	
PFOA	0.035	0.004	4
GenX	--	10	1.0 Hazard index

Hazardous substance

The Environmental Protection Agency is engaged in rulemaking, which if finalized, would designate PFOA and PFOS as hazardous substances.

Sulfate

Wild rice is an important part of the ecosystem in many Minnesota lakes and streams. Wild rice is also a cultural resource to many, particularly members of Minnesota's Dakota and Ojibwe tribal communities, and is an important economic resource to those who harvest and market it.

In 1973, Minnesota adopted a sulfate standard to protect wild rice based on studies showing that wild rice was found primarily in low sulfate waters.

MPCA conducted studies to develop criteria for a site-specific sulfate standard (MPCA, 2023). That work was withdrawn and MPCA announced on May 24, 2023 that the original 10 mg/L, previously approved, sulfate water quality standard will be implemented in NPDES/SDS permits going forward. This likely will effect all the MCES WWTP with the exception of St. Croix Valley.

Regulatory progress of other pollutants and resources to track

The Minnesota Pollution Control Agency triennially publishes its water quality standard work plan. This planning tool lists which contaminants of concern are moving through the standards process. The timeline and potential impact to wastewater treatment plant NPDES/SDS permits can be estimated from this list. A contaminant with a water quality standard can drive NPDES permit limits, which our wastewater treatment plants are required to meet.

Group 1 projects are near completion (estimated adoption into state law between 2021-2023).

- *Group 1A projects* are in rulemaking and have an estimated timeline for adoption into state law.

- *Group 1B projects* are when the MPCA has a basic concept of what may be included in the rule language and is preparing supporting documentation.

Group 2 projects are mid-way (defining rule language and preparing supporting documentation).

- *Group 2A projects* are in technical development and have all the information needed from outside the MPCA to evaluate how the standard will address environmental or programmatic concerns, and to assess the resources needed to promulgate and implement the standard.
- *Group 2B projects* are in initial technical development, which typically involves reviewing scientific literature, reviewing Minnesota-specific data, designing and undertaking studies, and reviewing and refining an EPA criteria document.

Group 3 projects have a longer unspecified time horizon.

- Group 3 projects are when the MPCA has not started development because of missing technical information, a lack of capacity, or both. Group 3 projects are likely to proceed to standard development, but they may remain in Group 3 without significant progress towards regulatory development throughout the three-year triennial period.

Group 1 projects:

Ammonia and Nitrate – Aquatic life water quality standard

An ammonia draft standard was expected to be released in 2022. In June 2022, the nitrate standard (5-17 milligrams per liter) was determined not ready and limit release was delayed. The nitrate standard would have high impact for us if the standard was less than 5 milligrams per liter. The draft chronic standard released in October 2022 for Class 2B waters is 8 milligrams per liter.

Group 2A projects

Aluminum, Copper, and Cadmium – Aquatic life water quality standard

The EPA developed updated criteria for aluminum, copper, and cadmium that reflect the latest scientific knowledge regarding the toxicity of these pollutants to aquatic life. The new criteria for aluminum and cadmium incorporate water hardness into the standard. The new criterion for copper is based on the biotic ligand model, which considers the amount of pollutant that is bioavailable and impacts aquatic life.

We meet the current criteria and will follow any new developments. No major impacts to our wastewater treatment plans are anticipated.

Group 2B projects

Chloride and Sulfate – Aquatic life water quality standard

The Class 2 aquatic life standard for chloride was selected for review and revision because newer science suggested Minnesota's water quality standard was potentially outdated. Since then, scientific studies have demonstrated that the interactions of ions (e.g., chloride, sulfate, calcium, and other ions) must be considered to accurately account for chloride's toxicity (MPCA, 2021). The Environmental Protection Agency is currently developing criteria for chloride along with sulfate and potentially other ions. It expects the Environmental Protection Agency's broad consideration of ionic toxicity will result in better and more comprehensive protection for aquatic life compared to more narrowly defined approaches commonly used today.

It is uncertain what the impact will be to Minnesota. The water quality standard is expected to rise when ion interactions are considered. It can be expected that Minnesota aquatic species, which may be more sensitive to chloride toxicity, will be used to determine water quality standards.

Our wastewater treatment plants effluent has been reviewed against the existing chloride water quality standard. Only the Rogers Wastewater Treatment Plant NPDES/SDS permit is impacted. This plant effluent flows into a wetland and must meet the chronic water quality standard of 230 mg/L at the outfall. As such, a chloride compliance plan has been put in place. Final compliance with the state water quality standard is due by June 1, 2031.

The chloride concentration trends for our wastewater treatment plants and their receiving streams continue to rise, as determined by an Environmental Services internal chloride team. A concern in the region is that higher chloride concentration in wastewater treatment plant effluent could limit off-site reuse of wastewater. It is important for us to assist in reversing the increasing trend of chloride in wastewater effluent and the environment.

Supporting municipality chloride reduction efforts like centralized softening and winter Smart Salt programs will help control this issue and prevent need to control this pollutant at the wastewater treatment plants in the future.

Developments in the sulfate standard will need to be monitored as they likely will impact most of our wastewater treatment plants. On May 24, 2023, MPCA announced the proposed changes to the sulfate water quality standard were withdrawn and MPCA plans to move ahead with implementation of the previously approved.

Group 3 projects

The MPCA has not started developing Group 3 projects because of missing technical information, a lack of capacity, or both. Group 3 projects are likely to proceed to standard development, but they may remain in Group 3 without significant progress towards regulatory development throughout the triennial period.

River Total Suspended Solids – Aquatic life water quality standard

This revision may be needed to account for rivers that have naturally high total suspended solids and high-quality biological communities (e.g., rivers in glacial lake beds where the soil can have high silt and clay content). A thorough review of Minnesota's total suspended solids and biological monitoring data (fish and invertebrates) must be completed to ascertain the basis

and likely approach for the revision prior to moving forward with this project. This review will be accomplished as MPCA staff availability allows.

PFOS in fish tissue – Human health water quality standard

Development of a statewide, fish-tissue based human health water quality standard for PFOS is needed to address the large number of Minnesota waters that are impaired for PFOS in fish tissue. Minnesota has been monitoring the presence of PFOS in fish tissue for several years.

Minnesota's PFAS Blueprint identified development of this water quality standard as a longer-term need (MPCA, 2021). A key reason the development date is in the future is that feasible methods to manage PFAS-contaminated water, biosolids, and other media are not yet available. The MPCA recently updated its site-specific criterion for PFOS in fish tissue for Lake Elmo and connected waterbodies, Bde Maka Ska, and Pool 2 of the Mississippi River. A statewide water quality standard requires additional development and is required to go through formal peer review prior to entering rulemaking.

Imidacloprid and Clothianidin – Aquatic life water quality standard

The Minnesota Department of Agriculture recently named clothianidin and imidacloprid as pesticides of concern in surface water. This designation means these pesticides were detected at concentrations of concern to aquatic life in rivers and streams relative to a water quality reference value. Minnesota does not have water quality standard for these pesticides.

Minnesota Department of Health – contaminant of emerging concern initiative

The Minnesota Department of Health (MDH) collaborates with partners and the public to identify contaminants of interest, investigates the health and exposure potential of contaminants of emerging concern in water, and informs partners and the public of appropriate actions for pollution prevention and reducing exposures to contaminants that might be unhealthy. MDH scientists with experience in exposure assessment, toxicology, water resources, and communication collaborate closely with other state agencies and groups outside of MDH. Partners include the public; various local, state, and federal government agencies; academic organizations; non-profit groups; industry groups; and drinking water and wastewater professional organizations.

We also follow this important work since some of these contaminants have the potential to impact wastewater.

Past successes

We have experience meeting new limits for phosphorus and mercury with a combination of source reduction, technology, and new creative and flexible regulatory tools.

- We implemented total phosphorus reductions at our treatment plants while the regulatory framework was in development by the MPCA. We acted on reducing the eutrophication at Lake Pepin before regulatory limits were enacted in the Lake Pepin TMDL.

- We used source control measures to meet another low-level toxic issue: mercury. We created a voluntary source reduction program, called the Mercury Minimization Plan, for dental amalgam that was key in mercury reduction. These plans are now required. In addition, new incinerator limits were set for mercury, requiring upgraded technology at the Metro Wastewater Treatment Plant. We responded to the new limits and a mercury control was installed on the incinerator. It is important to note that meeting NPDES and air quality permit limits may require different processes. This effort is an example of how low-level toxics reductions can be successfully accomplished by source reduction and should be considered for future reduction goals.

Contaminants of Regulatory Concern Recommendations

It is recommended to add a new policy addressing contaminants of regulatory concern. Draft policy is as follows:

"The Met Council will continue to partner, engage, and provide expertise in the research and regulatory work for contaminants of regulatory concern. The Met Council will continue participating in conversations with other public agencies to stay on top of emerging contaminants and any changing regulatory requirements."

Additional recommendations to implement this policy, specifically related to nitrogen and PFAS, resulting from an analysis of the Key Issues are:

Nitrogen

- The Met Council will continue to engage with stakeholder groups in the development of both potential ammonia water quality standards and the Minnesota Nutrient Reduction Strategy. We will provide resources and expertise to other agencies working towards the same goal.

PFAS

Currently there is no proven technology to treat municipal wastewater for all the types of PFAS at the very low levels that regulators are considering. Source reduction within the sewershed is currently the best strategy. The Met Council will:

- Develop communication tools to address this complex and quickly evolving topic.
- Continue internal development of PFAS knowledge.
- Develop risk-based priorities for accelerated actions, for example, focused source reduction at wastewater treatment plants with land application programs.
- Where appropriate support PFAS research related to wastewater treatment plants.

Centralized and decentralized wastewater planning

Our policy of implementing a centralized regional wastewater system dates back to the 1970s, when over 30 wastewater treatment plants were acquired and reduced to 10. This was undertaken because the wastewater systems across the region were inadequate to meet the needs of the growing region, inadequately treated wastewater was being discharged to local water bodies, and groundwater was being contaminated by failing septic-systems. 1988, we developed the “Wastewater Treatment and Handling Policy Plan,” which led to the adoption of these directives:

1. Evaluate technology needs to meet future water quality effluent standards.
2. Evaluate centralization/decentralization of the Metropolitan Disposal System in the long-term.

A neutral facilitator was selected to lead two workshops with the stakeholder groups including policy makers and implementors (Met Council and Metropolitan Waste Control Commission staff), regulators (MPCA, DNR, Army Corps of Engineers, USEPA, Board of Water and Soil Resources), clients (local government staff and residents), and technical advisors (the consultant team). Issues discussed included economics and community cost allocations, flexibility of the selected plan, environmental and land use impacts, public acceptance, growth patterns and service area limits, and integration with other regional systems.

The Metropolitan Waste Control Commission projected wastewater flows using 1992 forecasts. The team applied three models, including low, high, and preferred wastewater flow projections to evaluate the current treatment system and alternatives (Metcalf & Eddy, Inc., 1994).

At the time of the study, the wastewater treatment plants had an excellent regulatory compliance record, but almost all showed a need for additional capacity in the future. Most interceptors were found to be in excellent condition with capacity to serve forecasted growth. There were, however, two interceptors that were thought to have a greater impact on the results of this study. The first is the joint interceptor connecting Minneapolis and the western suburbs to the Metropolitan Wastewater Treatment Plant in Saint Paul. The joint interceptor had capacity, but the cities were separating combined sewers and eliminating sewer overflows as part of the combined sewer overflow program. The team anticipated reduced storm inflows but were concerned that the elimination of overflows could increase peak flows. Further information was needed to confirm available capacity in the joint interceptor. Second, the interceptor serving Woodbury, Oakdale, and Northeast (Upper WONE, also called WO-500) and Carver Lake Interceptors (Oakdale, Lake Elmo, Woodbury) was a driving factor, as the team anticipated high growth in the City of Woodbury.

The process of developing alternatives was extensive. The team started with 64 alternatives placed in two categories: Central (with one or two major wastewater treatment plants) or Regional (with three-ten wastewater treatment plants). After environmental, economic, political, and technical factors were considered, only one central alternative remained. After considering additional screening criteria, including a detailed analysis of capital costs, the list was narrowed to six alternatives. All retained Blue Lake, Empire, Hastings, Metro, Seneca, and St. Croix Valley Wastewater Treatment Plants, with the current Chaska Wastewater Treatment Plant flows going to Blue Lake Wastewater Treatment Plant.

The team used GIS and a hydraulic model to evaluate the six alternatives. The team divided the current regional wastewater system into 15 areas. Those areas with high growth and limited capacity were considered vulnerable, so service requirements in those areas were closely monitored to identify deviations from current projections.

It was recognized that some assumptions could change, including forecasts, projected service areas, and projected treatment and discharge requirements. The ability to adjust to changes was required for proper planning. A review of the six alternatives showed varying levels of flexibility when facing changes in assumptions.

Ultimately, the team ranked the alternatives using the following criteria: adaptability, economics, environmental impacts, flexibility, ability to implement the alternative, and less reliance on existing major facilities. The chosen alternative included the following actions:

1. Maintain and expand facilities at Blue Lake, Empire, Hastings, Seneca, and St. Croix Valley wastewater treatment plants as regional plants serving the current service areas and projected flows.
2. Eliminate the Chaska Wastewater Treatment Plant and divert flow to the Blue Lake Wastewater Treatment Plant.
3. Eliminate the Rosemount Wastewater Treatment Plant to the South Saint Paul lift station immediately to avoid interim improvements.
4. Eliminate the Cottage Grove Wastewater Treatment Plant and construct a regional plant in the southeast metro to serve Cottage Grove, Inver Grove Heights, Newport, Rosemount, South Saint Paul, Saint Paul Park, and Woodbury.
5. Construct a Cottage Grove Ravine interceptor to relieve the Upper WONE interceptor and Carver Lake interceptor.
6. Divert the South Saint Paul lift station service area (which included Inver Grove Heights, Newport, Rosemount, South St. Paul, and St. Paul Park) from Metro Wastewater Treatment Plant to the new southeast regional plant.
7. Construct a new Elm Creek interceptor to serve the northwest metro.

The selected plan was anticipated to be $711 million, including phosphorus removal at the new southeast regional plant and St. Croix Valley Wastewater Treatment Plant. This cost was 14% higher than the alternative with the lowest capital cost, however, the plan that was chosen ranked the highest considering all six of the screening criteria.

The regional wastewater system has provided for growth and excellent regulatory compliance, which were seemingly the main concerns of the last centralization/decentralization study. However, 30 years have passed since the study was completed, and new research and changing wastewater treatment technologies, among other factors, push the need to revisit this analysis for current and future planning of the regional wastewater system. For example, we now recognize that there are other factors that influence wastewater planning, including wastewater reuse, water supply concerns, ecological impacts, equity, and environmental justice impacts.

For the purposes of this paper, the following definitions apply:

- Decentralized wastewater systems treat and disperse wastewater at or near the source of the wastewater discharge. This includes onsite systems, cluster treatment systems, systems serving a small community as well as commercial and industrial complexes, and sewer mining and reuse facilities.
- Centralized wastewater systems are conventional systems serving large areas at an often-isolated downstream location. When upgrades are needed, they are often high cost and limited by the technology that was originally installed at the facility. Reuse is only available at the most downstream location, which is usually isolated and requires high pumping costs to provide reuse water back to users upstream. A centralized system directs any new flows to the existing infrastructure, to be treated at the central treatment location.

Decentralized satellite facilities that mine wastewater from a large interceptor to be treated and disposed (and in some cases reused) could be an alternative to a costly upsizing of a lengthy interceptor or construction of a new interceptor or siphon because of the regained capacity. The capacity gains can alleviate capacity bottlenecks, accommodate future growth, and push out the timing for treatment plant expansions downstream. They also provide a level of resiliency to the regional system and allow utilities to explore treatment technologies that would not otherwise be possible at large centralized treatment plants.

Decentralized systems at key points in the regional system could also provide pretreatment to enhance performance at the centralized treatment plant downstream and wastewater surveillance for tracking certain contaminants. Pretreatment could include addressing fats, oils, and grease, grit, industrial contaminants, and other upstream source pollution.

Beyond the need to continue to serve growth, the metropolitan region is also facing water supply concerns resulting from both environmental conditions and population growth. Wastewater reuse at decentralized facilities is one potential solution to be considered. Reuse can be used for irrigation, groundwater recharge, subsurface infiltration, ecological enhancement, and a variety of nonpotable uses including cooling towers, industrial uses, commercial car washing, and more. Refer to the Water Reuse research paper for more information on water reuse and the barriers to wide-spread application. Decentralized systems release or reuse wastewater closer to the original source, potentially within the same watershed, as opposed to releasing the effluent much further downstream.

Strategically located decentralized wastewater reuse facilities could draw new customers and expand the scope of services, providing reuse water for nonpotable water uses and to large water users, including industries and commercial users, institutional facilities, and construction contractors.

Since the 1992 study, the region has grown significantly. It is recommended that the study be reviewed to consider the current regional system, growth forecasts, capital, maintenance and operation costs, regulatory compliance, changes in treatment technologies, area-specific concerns, equity, and the many other factors that influence wastewater regional planning. Expansion efforts across the system need to be analyzed on a case-by-case basis. Centralized planning throughout the system may not be the most beneficial strategy for all areas within the

region, although providing the benefits of economies of scale. Some areas may benefit more from a decentralized approach: onsite treatment and resource recovery (including wastewater or heat) or other smaller-scale systems. System changes would only occur if there is a regional benefit.

Urban and rural wastewater considerations add complexity to regional wastewater planning and invoke different concerns. For example, wastewater from the largest service area of the region is directed great distances downstream through Minneapolis and Saint Paul to the Metropolitan Wastewater Treatment Plant. Neighborhoods in that area are predominately communities of Black, Indigenous, and people of color, and have expressed concerns of an undue burden. For rural expansion, the benefit of providing a local treatment works or connection to the interceptor system for treatment at an existing wastewater treatment plant must be considered against the rate increase in these communities as well as how those costs will be recouped and the impacts to existing rate payers. The previous study primarily focused on growth, cost, and regulatory compliance. It is recommended to also include a more expansive range of factors that support a healthy, prosperous region and protect the region's water.

Centralized and decentralized wastewater planning recommendations

No policies or implementation actions are suggested at this time regarding centralized and decentralized wastewater planning. It is important to note this topic has come up internally and continues to occur.

It is recommended to revisit this study and update it with more current information to provide better guidance for any future decisions. If this is revisited, it also provides an opportunity to consider equity in wastewater planning. Study findings may inform future policy in this area.

Wastewater surveillance

During the COVID-19 pandemic, we worked with the Minnesota Department of Health, the University of Minnesota Medical School, and the University of Minnesota Genomics Center to better understand the prevalence of COVID-19 in the population. Our staff collected wastewater samples and extracted the viral genetic material to send to the Genomics Center, where the concentration of SARS-CoV-2 viral material in the wastewater was measured.

This partnership gave scientists and public health officials another resource to guide public health decisions and was informative to the region. From this effort, other conversations about wastewater surveillance were started.

The University of Minnesota Medical School and Genomics Center have broached the conversation to consider long-term and on-going monitoring of wastewater for public health issues. The Minnesota Department of Health is also increasing its internal capacity for wastewater monitoring. At the federal level, the government is implementing a National Wastewater Surveillance System.

Major organizations are considering the benefits of wastewater surveillance in the pursuit of gaining public health insights. Tracking viruses other than COVID-19 is also a topic of

conversation, especially since wastewater analysis can serve as a public health indicator and show the extent of infections in communities.

We may support future requests for wastewater surveillance if the effort supports research and development, to provide regional public health insights that benefit those living in our service area. There must be some funding mechanism in place to cover the expenses and tasks outside of regular staff duties.

It is recommended to maintain flexibility in the event of future wastewater monitoring. Each request will bring different goals and desired outcomes. Considering the experience with COVID-19 wastewater monitoring, we recommend offering our technical expertise and services with other public entities.

Wastewater surveillance recommendations

It is recommended to add a new policy addressing wastewater surveillance. Draft policy is as follows:

"The Met Council will support efforts to investigate if or how Environmental Services can assist in wastewater surveillance in the interest of public health insights, when the need arises and funding is available. The Met Council will continue to partner with public health agencies to remain aware of when the Met Council can provide insights."

Equity considerations

Wastewater treatment is vital to protecting public health and the environment. Equity has not always been a primary consideration in the past when making decisions for the region.

Two themes emerge during conversations about wastewater equity: financial implications and infrastructure siting.

Financial implications

Local retail sewer rates, which include our wholesale rate, are among the lowest in the nation. A National Association of Clean Water Agencies survey of 2020 rates showed an average annual sewer service charge for a single-family residence of $347 for our city and township customers, with a peer average of $535 (NACWA, 2021). We host multiple budget information sessions to communicate that information with our customers. When rate changes are proposed, customers are engaged through multiple avenues. It is important to keep costs low to be accessible to all users of the wastewater treatment system and to ensure cost is not a financial burden to those that rely on its service. It is important to note that as a wholesaler of wastewater service, we do not have the ability to dictate how a city or township passes on wastewater costs to its residents. The regional wholesale rate structure is based on a regional cost of service, consistent with the Met Council's statutes, strategies and policies.

Infrastructure siting

The location of our wastewater conveyance and treatment infrastructure is a challenging topic. The Metropolitan Wastewater Treatment Plant, for example, is located near overburdened communities impacted by environmental pollution like industrial emissions and odors. While we work to limit our impact, it is important to consider the proximity of the Metropolitan Wastewater Treatment Plant to these communities when planning necessary system improvements and expansions. As the region grows in population, any expansion, reinvestment, modification, or addition to the wastewater system can and should consider equity of the served communities by incorporating feedback from impacted communities. In addition, we have recently expanded our communication with Tribal Nations to avoid or minimize potential impacts to sites and resources of Tribal significance.

We strive to continue learning and to go beyond the traditional methods of communication and outreach. Communication and outreach can and should be done in different languages, modes of delivery, and at different times of day for meetings and information sessions, to name a few examples.

Further opportunities for equity include expanded efforts and means of stakeholder engagement and incorporating feedback throughout the planning process. We develop and implement a community engagement plan for all our wastewater projects that impact residents, neighborhoods, and stakeholders. We want to partner in each aspect of decision-making, including identifying project alternatives and preferred solutions. We will continue to collaborate with local stakeholders and impacted parties to incorporate their thoughts, suggestions, and perspectives in our work.

We strive to identify and act on opportunities to enhance the community through our project delivery process. Our Capital Finance Principles are as follows:

1. Treat customers and stakeholders respectfully.
2. Leave the community with something better than they had prior to our project.
3. Plan and coordinate projects with other public infrastructure work.
4. Keep commitments made during planning, design, and construction.
5. Communicate in a manner as consistent and thorough as possible with each community involved.

These principles can be followed to improve relationships with residents of the region as well as improve the environment around our project sites. These also support our efforts to leave project sites better than they were before, which is an opportunity to enhance areas historically underserved by regional improvements.

We will continue incorporating wastewater equity into our work. We are a member of the Water Equity Network through the US Water Alliance, a non-profit group that advances policies and programs that promote management of water resources to improve everyone’s quality of life. The goal of our participation is to learn new ways to incorporate equity in our work and share ideas with participating organizations and utilities.

Connections to current policy

The 2040 Water Resources Policy Plan has existing policies that pertain to wastewater. A summary of our Met Council Policies and Implementation Strategies can be found in Appendix D of the Water Resources Policy Plan.

Policy on Water Conservation and Reuse
"The Council will work with our partners to identify emerging issues and challenges for the region as we work together on solutions that include the use of water conservation, wastewater and stormwater reuse, and low-impact development practices to promote a more sustainable region."

Policy on Serving the Urban Area
"The Council will plan for sustainable water resources that protect public health, provide recreational opportunities, maintain habitat and ecosystem health, and ensure that supplies of potable water are sufficient for the orderly and economical development and redevelopment of the metro area long into the future. A community's comprehensive plan is expected to accommodate the forecasts and to meet the densities specified in the Council's Thrive MSP 2040 plan.

A community's comprehensive plan must include:

A water supply plan that is informed by the Twin Cities metro area Master Water Supply Plan and meets the Department of Natural Resources plan requirements.

A local surface water management plan that is consistent with Minnesota Rules Chapter 8410 and Council policy, and does not adversely impact the regional wastewater system.

A comprehensive sewer plan that is consistent with the regional wastewater system plan.

Inconsistencies between the local plans and the Council's plans may result in the Council's finding that the community's plan is more likely than not to have a substantial impact on, or contain a substantial departure from, the metropolitan system plan, thus requiring modifications to the local comprehensive plan."

Policy on Serving the Rural Area
"The Council will acquire wastewater treatment plants owned by Rural Centers, based upon their request through the comprehensive plan and comprehensive sewer plan processes, and based upon criteria that ensure direct identifiable regional benefits, after soliciting customer input and conducting a public hearing on the request."

Policy on Private Wastewater Systems
"Communities that permit the construction and operation of subsurface sewage treatment systems and other private wastewater treatment systems within their communities are responsible for ensuring that these systems are installed, maintained, managed, and regulated consistent with Minnesota Pollution Control Agency rules. The Council will not provide financial support to assist communities if these systems fail."

Policy on Investment

"The Council will strive to maximize regional benefits from regional investments."

Policy on Wastewater Sustainability
"The Council will provide efficient, high-quality, and environmentally sustainable regional wastewater infrastructure and services.

The Council shall conduct its regional wastewater system operations in a sustainable manner as is economically feasible. Sustainable operations relate not only to water resources but also to increasing energy efficiency and using renewable energy sources, reducing air pollutant emissions, and reducing, reusing, and recycling solid wastes."

Policy on Inflow and Infiltration
"The Council will not provide additional capacity within its interceptor system to serve excessive inflow and infiltration.

The Council will establish inflow and infiltration goals for all communities discharging wastewater to the regional wastewater system. Communities that have excessive inflow and infiltration in their sanitary sewer systems will be required to eliminate the excessive inflow and infiltration within a reasonable time period."

Policy on Wastewater System Finance
"The Council will continue to implement regional wastewater service fees and charges based on regional cost of services and rules adopted by the Council."

Connections to Other Policy
It is important to also note other regional plans have policy and implementation activities that are related to wastewater, specifically in ***Housing Policy Plan*** and ***Regional Parks Policy Plan***.

Draft new policy and implementation strategies

This section provides existing policies and implementation actions that are suggested to keep (with modifications that strengthen the recommendation) and new policies that are recommended based on the Key Issues identified in this paper. Additional implementation actions, determined from the analysis of the Key Issues, are provided as well. All of the below content is intended to spark discussion and ideas to help hone the policy language for the next plan.

Policy on water conservation and reuse

It is recommended to keep the current policy as written. This paper supports the policy recommendations and implementation activities related to wastewater reuse proposed in the Water Reuse research paper. Although no additional implementation actions are suggested here, we acknowledge that decreasing water consumption is an effective way to preserve or recapture hydraulic wastewater system capacity. The Met Council will continue to support efforts and relationships to reduce water consumptive use.

The following implementation strategies relate to wastewater concerns under this policy:

- In partnership with others, research and promote low-impact development, land use practices, agricultural best practices, and cooperative water use practices that minimize impacts on aquifers and maximize groundwater recharge, where practical.
- Promote and support water conservation measures, including education, outreach, and tool development.
- To supplement groundwater and surface water, investigate reusing treated wastewater as sources of nonpotable water to support regional growth, and when cost-effective, implement reuse.
- The institutional arrangements and cost of service approach for wastewater reuse are important to the development of wastewater reuse in the region. In implementing wastewater reuse opportunities, the Council will use the following approaches:
    - Council shall use a cost-of-service, case-by-case approach to wastewater reuse in cooperation and partnership with local communities. The Council will evaluate the potential regional benefit of a potential wastewater reuse project and, if the Council's criteria are met, will determine an appropriate cost share, provided that the cumulative regional cost share shall not exceed 0.75% of the total annual municipal wastewater charges.
    - Criteria to be used to evaluate whether there is a regional benefit to a potential wastewater reuse opportunity shall include: (1) the regional wastewater system was built to service long-term growth in a sub-regional service area in which (a) water managers now recognize concerns about sustainable water supply and the importance of meeting the needs of future generations while not harming ecosystems, degrading water, or reducing water levels beyond the reach of public water supplies and private wells and (b) a growing demand for groundwater could mean it will be difficult to obtain a groundwater use permit from the Department of Natural Resources; and/or (2) the proposed reuse project reduces Environmental Services' surface water discharge, delaying capital improvements to meet more stringent regulatory requirements.
    - Council shall hold a public hearing to obtain customer and public input prior to making a final determination on regional benefit and regional cost share.
    - Implementation of each wastewater reuse project shall be consistent with the comprehensive plan of the community in which the reclaimed water user is located.
    - Council shall enter into a joint powers agreement with the community in which the reclaimed water user is located to define the reclaimed water service institutional arrangements and to avoid competition with municipal water suppliers.
    - Council shall enter into a long-term reclaimed water service agreement with each user, using a cost-of-service approach, including a potential regional cost share where appropriate.
    - Council shall pursue sources of non-Council funding to complement Council funding of wastewater reuse projects, including Clean Water Legacy Funds, state bond funds, and reuse grants.

- Council shall report about the wastewater reuse pilot program at Council's annual budget outreach meetings.

Policy on serving the urban area

It is recommended to keep the current policy as written.

The following implementation strategies relate to wastewater concerns under this policy:

- Provide a level of wastewater service commensurate with the needs of the growing metro area, and in an environmentally sound manner.
- Provide sufficient capacity in the wastewater system to meet the growth projections and long-term service area needs identified in approved local comprehensive sewer plans.
- Stage wastewater system improvements, when feasible, to reduce the financial risks associated with inherent uncertainty in growth forecasts.
- Potentially implement early land acquisition and work closely with communities to preserve utility corridors when it is necessary to expand its facilities or locate new facilities needed to implement the wastewater system plan.
- Efficiently use existing sewer investments in developing and redeveloping areas.
- Preserve unsewered areas inside the Long-Term Wastewater Service Area for future development that can be sewered economically.
- Extend wastewater service to suburban communities if the service area contains at least 1,000 developable acres.
- Require that all communities currently served by the regional wastewater system remain in the system.
- Acquire wastewater treatment plants from suburban communities outside the current service area, based upon their request through the comprehensive plan and comprehensive sewer plan process, after soliciting customer input and conducting a public hearing on the request.

No additional implementation actions are suggested.

Policy on serving the rural area

It is recommended to modify the current policy as suggested in bold below:

"The Met Council will acquire wastewater treatment plants owned by Rural Centers, based upon their request through the comprehensive plan and comprehensive sewer plan processes, **if the requested acquisition:**

- **Provides cost-effective service**
- **Accommodates assigned growth**
- **Protects public health and well-being**
- **Currently meets or, with improvements can meet, environmental and regulatory requirements.**

In addition, customer input must be solicited and a public hearing on the request must be conducted."

The following implementation strategies relate to wastewater concerns under this policy:

- Accept the wastewater service request only when the following criteria are met:
    - The community accepts the Council's growth forecasts, as well as preserves at least 1,000 developed or developable acres for growth through the land use planning authority of the county or adjacent township(s) or through an orderly annexation agreement or similar mechanism to provide for staged, orderly growth in the surrounding area.
    - The community has a DNR-approved water supply plan.
    - The community has a watershed approved local surface water plan.
    - The community has adequate transportation access.
    - The community lies within the Long-Term Wastewater Service Area or other regional benefits would result, such as economic development unique to the rural area or preservation of high-value water resources.
    - There are feasible and economical options for siting and permitting an expanded wastewater treatment plant or for extending interceptor service.
    - The Council has sought customer input, has conducted appropriate financial analysis, and has conducted a public hearing on the community's wastewater service request.
- Require that, if the most economical and beneficial wastewater service option is to construct a regional interceptor to serve the community, the Council will not acquire the community's wastewater treatment plant, and the community will be responsible for decommissioning its treatment plant.
- Not allow connections to the regional wastewater system outside the sewered rural community. The Council may construct capacity to serve the long-term needs of the rural and agricultural planning areas, but will not provide service until the Council, in consultation with the appropriate community, designates the area as a developing community and the community amends its comprehensive plan accordingly.
- Preserve areas outside the Long-Term Wastewater Service Area for agricultural and rural uses, while protecting significant natural resources, supporting groundwater recharge, protecting source water quality, and allowing limited unsewered development.

Additional recommendations to implement this policy, resulting from an analysis of the Key Issues outlined in this paper are that the Met Council will:

- Consider providing a higher level of service for liquid waste haulers by investigating adding and maintaining liquid waste receiving sites.
- Partner with state agencies to discuss subsurface sewage treatment system disposal facilities and rural access to disposal sites.

Policy on private wastewater systems

It is recommended to keep the current policy as written.

The following implementation strategies relate to wastewater concerns under this policy:

- To ensure that failing systems do not cause the need to prematurely extend the metropolitan disposal system, the Council, through the local comprehensive planning process, requires that communities submit copies of their ordinances for subsurface sewage treatment systems and information on their management programs for these systems.
- The Council will continue to support State rules for subsurface sewage treatment systems and other private wastewater systems.
- The Council will allow a community to connect a failing subsurface sewage treatment system or other private wastewater treatment system to the regional wastewater system at the community's expense.

Additional recommendations to implement this policy, resulting from an analysis of the Key Issues outlined in this paper include:

- The Met Council will give higher priority to service extensions in those areas with subsurface sewage treatment systems that have a higher likelihood of contaminating source water protection areas through spills or underperforming systems.

Policy on investment

It is recommended to keep the current policy as written.

The following implementation strategies relate to wastewater concerns under this policy:

- Invest in nonpoint-source pollution control when the cost and long-term benefits are favorable compared to further upgrading wastewater treatment.
- Invest in wastewater reuse when justified by the benefits for supplementing groundwater and surface water as sources of nonpotable water to support regional growth, and by the benefits for maintaining water quality.

Additional recommendations to implement this policy, resulting from an analysis of the Key Issues outlined in this paper are that the Met Council will:

- Perform cost/benefit analyses, including environmental impact studies, if customers express a need for a higher level of service, for example, opening or reopening a liquid waste disposal site, to ensure all waste is efficiently and effectively processed and all rate payers have access to reasonable and appropriate levels of service.
- Consider future infrastructure investments with an equity and environmental justice perspective to minimize impacts and leave the community with something better than what they had.

Policy on wastewater sustainability

It is recommended to keep the current policy as written.

The following implementation strategies relate to wastewater concerns under this policy:

- Implement and enforce Waste Discharge Rules for the regional wastewater system.
- Preserve regional wastewater system assets of the Council through effective maintenance, assessment of condition and capacity, and capital investment.
- Accept septage, biosolids, leachate, and other hauled liquid waste at designated sites, provided that the waste can be efficiently and effectively processed.
- Reuse treated wastewater to meet nonpotable water needs within Council wastewater treatment facilities where economically feasible.
- Provide industries with incentives to pretreat wastewater to reduce its strength and thus provide the most environmental and economical benefit for the region.
- Generate energy from biosolids processing, utilize energy-efficient processes and equipment, and reduce building-energy use.
- Pursue other renewable energy sources, such as solar power generation, thermal energy recovery, and new technologies – such as fuel cells − as they become proven and economical.
- Stabilize and reduce the volume of biosolids through thermal processing or anaerobic digestion, and utilize the remaining solids as fertilizer and soil conditioner.
- Improve sustainability of wastewater operations, when economically feasible.

We are currently considering the Met Council's new Climate Action Work Plan to determine how it may impact and guide our new policy on wastewater sustainability.

Policy on inflow and infiltration

It is recommended to keep the current policy with the text change indicated in bold.

"The Met Council will not provide additional capacity within its interceptor ***and treatment systems*** *to serve excessive inflow and infiltration.*

The Met Council will establish inflow and infiltration goals for all communities discharging wastewater to the regional wastewater system. Communities that have excessive inflow and infiltration in their sanitary sewer systems will be required to eliminate the excessive inflow and infiltration within a reasonable time period."

The following implementation strategies relate to wastewater concerns under this policy:

- Maintain and rehabilitate Council interceptors to minimize inflow and infiltration.
- Develop inflow and infiltration goals for all communities served by the regional wastewater system.
- Require all communities served by the regional wastewater system to include its inflow and infiltration mitigation program in its comprehensive sewer plan, including a program to mitigate sources of inflow and infiltration from private property.

- Limit expansion of service within those communities where excessive inflow and infiltration jeopardizes the Council's ability to convey wastewater without an overflow or backup occurring, or limits the capacity in the system to the point where the Council can no longer provide additional wastewater services. The Council will work with those communities on a case-by-case basis, based on the applicable regulatory requirements.
- Potentially institute a wastewater rate demand charge for those communities that have not met their inflow and infiltration goal(s), if the community has not been implementing an effective inflow and infiltration reduction program as determined by the Council, or if regulations and/or regulatory permits require Council action to ensure regulatory compliance.
- The wastewater demand charge will include the cost of wastewater storage facilities and/ or other improvements necessary to avoid overloading Council conveyance and treatment facilities, and the appropriate charges for use of capacity beyond the allowable amount of inflow and infiltration.
- Work with the State to attempt to (1) make funds available for inflow and infiltration mitigation, and (2) promote statutes, rules, and regulations to encourage I/I mitigation.
- Develop a program to assist communities with reducing inflow and infiltration from private property sources.

Additional recommendations to implement this policy, resulting from an analysis of the Key Issues outlined in this paper are that the Met Council will:

- Continue to support, advocate, and coordinate with Metro Cities for state bond funding for municipal public system inflow and infiltration grants.
- Advocate for dedicated and reliable funding for private property inflow and infiltration mitigation and pursue grant program recommendations from the 2023 Private Property Inflow and Infiltration Task Force.
- Consider direction from the Climate Action Work Plan when considering climate impacts on inflow and infiltration.

Policy on wastewater system finance

It is recommended to keep the current policy as written.

The following implementation strategies relate to wastewater concerns under this policy:

- Metropolitan wastewater charges will be allocated among local government units based on volume of wastewater treated.
- Industrial wastewater strength charges will be based on actual or average discharge strength above domestic wastewater strength.
- Load charges for septage, portable-toilet waste, holding-tank wastewater and out-of-region wastes will be uniform for each type of load, and based on the volume of the load, the average strength of the types of loads, and the costs of receiving facilities.
- Sewer availability charges (SAC) will be uniform within the urban area based on capacity demand classes of customers and the SAC Procedure Manual. Sewer availability

charges for a Rural Center will be based on the reserve capacity and debt service of facilities specific to the Rural Center.

- Other fees recovering costs of specific services may be imposed, as approved by the Council.
- Cost-sharing between the Council and a local governmental unit may be used when construction of regional wastewater facilities provides additional local benefits for an incremental increase in costs.
- Facilities that are no longer a necessary part of the regional wastewater system will be conveyed to the benefiting local governmental unit, or will be abandoned or sold, pursuant to related statutes.
- The Council will seek customer input prior to, and give at least three months, notice of, any material changes in the design of charges.
- The Council will continue efforts to work to simplify and improve SAC and to communicate to customers.

Additional recommendations to implement this policy, resulting from an analysis of the Key Issues outlined in this paper are that the Met Council will:

- Collaborate with partner organizations who advocate for and assist with household water and wastewater affordability.
- Continue Sewer Availability Charge (SAC) loan programs for small businesses (new or expanding) and qualifying existing residential connections to the Metropolitan Disposal System.

Policy on interceptor ownership transfer

The Met Council has statutory authority to convey interceptors by determining that the interceptor no longer serves a regional benefit. Environmental Services maintains a list of facilities that no longer satisfy the definition of an interceptor.

The Met Council intends to convey existing interceptors that no longer meet the definition of a regional interceptor to benefited communities, thus shifting management and costs to the appropriate government and providing regional service at competitive and equitable rates. If an interceptor has no local benefit, the interceptor and related facilities will be abandoned.

Therefore, it is recommended to reinstate a policy on interceptor reconveyance. Draft policy is as follows:

"Interceptors and related facilities for the collection, treatment, and disposal of sewage in the metropolitan area that are no longer needed to implement the regional wastewater system plan will be reconveyed, abandoned, or sold to the appropriate local governmental unit pursuant to statutes."

The following implementation strategies are recommended for adoption to support this policy.

- An existing interceptor (or segment of it) is no longer necessary to the regional wastewater system when it serves:
    - Primarily as a local trunk sewer; or
    - As a local trunk sewer that conveys 200,000 gallons per day or less from an upstream community; or
    - A local trunk sewer that conveys only stormwater.

  Unless,
    - The interceptor has been designed to provide wastewater service to all or substantially all the upstream community; or
    - The flow from the upstream community is greater than 50% of the total forecasted flow at any part within the interceptor.

Policy on wastewater surveillance

It is recommended to add a new policy addressing wastewater surveillance. Draft policy is as follows:

"The Met Council will support efforts to investigate if or how Environmental Services can assist in wastewater surveillance in the interest of public health insights, when the need arises and funding is available. The Met Council will continue to partner with public health agencies to remain aware of when the Met Council can provide insights."

Policy on contaminants of regulatory concern

It is recommended to add a new policy addressing contaminants of regulatory concern. Draft policy is as follows:

"The Met Council will continue to partner, engage, and provide expertise in the research and regulatory work for contaminants of regulatory concern. The Met Council will continue participating in conversations with other public agencies to stay on top of emerging contaminants and any changing regulatory requirements."

Additional recommendations, specifically related to nitrogen and PFAS, to implement this policy, resulting from an analysis of the Key Issues outlined in this paper include:

Nitrogen

- The Met Council will continue to engage with stakeholder groups in the development of both potential ammonia water quality standards and the Minnesota Nutrient Reduction Strategy. We will provide resources and expertise to other agencies working towards the same goal.

PFAS

Currently there is no proven technology to treat municipal wastewater for all the types of PFAS at the very low levels that regulators are considering. Source reduction within the sewershed is currently the best available strategy. The Met Council will:

- Develop communication tools to address this complex and quickly evolving topic.
- Continue internal development of PFAS knowledge.
- Develop risk-based priorities for accelerated actions, for example, focused source reduction at wastewater treatment plants with land application programs.
- Where appropriate support PFAS research related to wastewater treatment plants.

Next steps

This topical research paper is the first step in the process of creating regional water policies to safeguard our waters and to protect the livability and prosperity of the region (**Figure 10**). The ideas in this paper are intended to spark discussion and generate additional water-focused policy recommendations to provide the foundation of the 2050 Water Resources Policy Plan. This paper was created and reviewed by our Met Council staff. Our planned next step is to gather and include the perspectives of our partners on important policy recommendations.

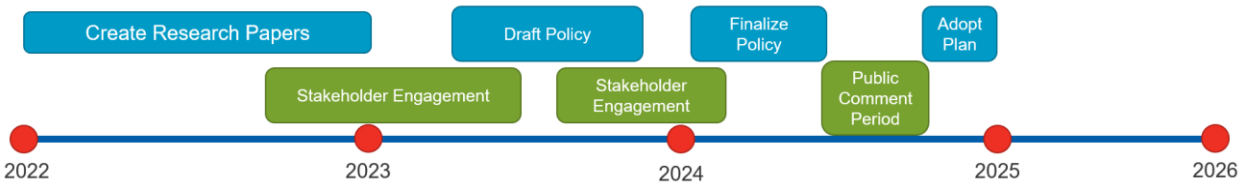


Figure 10: Water Resources Policy Plan timeline

After this additional information is gathered, we will update the draft policy recommendations through an interactive process of drafting policies, listening to stakeholder feedback, and integrating the information collected to assist our Metr Council members in developing, evaluating, refining, and adopting these new policies. Alternating between engagement and policy creation will allow stakeholders to participate and shape plan content from the very beginning. This proposed process is an intentional attempt to bring more voices and perspectives to the table, and to help us produce polices and implementation strategies that are reflective of the region's water priorities.

If you have any questions or feedback about the content of this paper, please contact **Kyle Colvin** at ***Kyle.Colvin@metc.state.mn.us***.

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