

Water Supply Planning in the Twin Cities Metropolitan Area

**Report to the 2007
Minnesota State Legislature**

January 2007

Mission

The mission of the Metropolitan Council is to develop, in cooperation with local communities, a comprehensive regional planning framework, focusing on wastewater, transportation, parks and aviation systems, that guides the efficient growth of the metropolitan area. The Council operates wastewater and transit services and administers housing and other grant programs.

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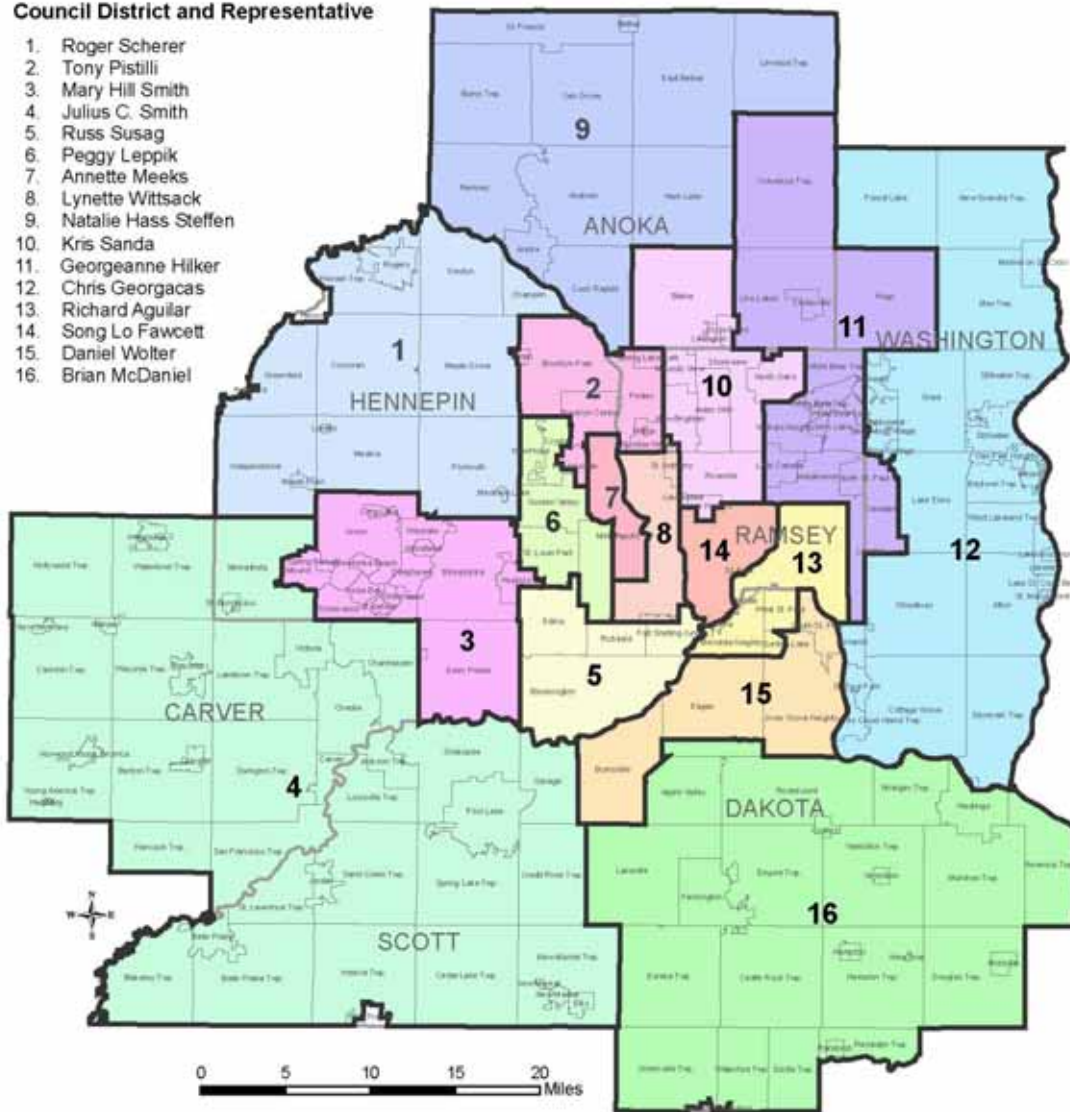
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Revised June 19, 2006

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EXECUTIVE SUMMARY

The 2005 Minnesota Legislature directed the Metropolitan Council (Council) to “carry out planning activities addressing the water supply needs of the metropolitan area” (Minnesota Statutes, section 473.1565). Specifically, the Council is charged with developing a base of technical information for water supply planning decisions and to prepare a water supply master plan for the metropolitan area. The legislature also established a Water Supply Advisory Committee to assist the Council in its planning activities, and directed the Council to submit regular reports to the legislature detailing progress. The first report is due by the date the legislature convenes in 2007, and subsequent reports are due every five years thereafter. This document satisfies the requirement of Minnesota Statutes, section 473.1565, subdivision 3 as the first report to the legislature.

In implementing the legislature’s directive, the Council organized its work efforts in two phases. Activities in Phase I which was completed with submittal of this report included:

Taking inventory and developing initial assessment. The Council collected information and data on metropolitan area water facilities, water sources and resource monitoring locations to determine where information and data gaps occur. In addition, current and projected water demands were evaluated and resource limitations identified.

Coordinating with stakeholders. The Council worked closely with the Water Supply Advisory Committee by presenting periodic updates, reports and materials for discussion on topics of concern to the committee. The Council also sponsored three public workshops to solicit input from local communities and other interested parties. In addition, the Council gathered input from various technical work groups focused on specific aspects of its planning efforts.

Preparing a report to the legislature. This report provides background information, studies conducted, next steps and legislative recommendations in the following areas: water demand and availability, regulatory process, safety and security, and funding.

Phase II will begin in January 2007 and will culminate with the completion of the Regional Water Supply Master Plan in 2008. This phase will consist of the following activities:

Continued work technical studies and assessments. The Council will continue to perform studies on issues identified in Phase I as outlined in this report.

Continued enlistment of stakeholder involvement. The Council will continue to solicit input from the Water Supply Advisory Committee and other interested parties throughout the region. The advisory committee is set to sunset December 31, 2008.

Development of a regional water supply master plan. As required by Minnesota Statutes, section 473.1565 a master plan will be prepared which will include guidance for local water supply systems and future regional investment with an emphasis on conservation, interjurisdictional cooperation, and long-term sustainability. The plan will also address the reliability, security and cost-effectiveness of the metropolitan area water supply system and its local and subregional components.

Key Requirements of Minnesota Statutes, Section 473.1565, Subdivision 1 (with reference to their location in this report): (note, will be updated following editing)

- 1) Development and maintenance of a base of technical information:
 - Surface and groundwater availability **Pages 13–19**
 - Water demand projections **Pages 10–12**
 - Water withdrawal and use impacts **Phase II activity**
 - Modeling **Phase II activity**
- 2) Development and periodic update of a metropolitan area master water plan
 - Guidance for local water supply systems and future regional investments **Phase II activity**
 - Conservation **Page 25**
 - Interjurisdictional cooperation **Pages 8; 32-33**
 - Sustainability **Phase II activity**
 - Reliability and security..... **Pages 27–31**
 - Cost effectiveness of the metropolitan area water supply system **Phase II activity**
- 3) Clarifying appropriate roles and responsibilities of local, regional and state government **Page 21-24**
- 4) Streamlining and consolidating decision making and approval processes..... **Pages 23–25**
- 5) Long-term funding considerations..... **Page 33-34**

Summary, Next Steps and Recommendations

During Phase I of implementing the legislature’s directive, the Council collected a base of technical information including surface water and groundwater limitation analyses, water demand projections, water supply system, and water monitoring location information. Throughout Phase I it was made clear that it is important to evaluate water availability in the context of projected growth to ensure a sustainable and reliable supply throughout region. The issues raised during Phase I will be addressed during Phase II and the findings and recommendations of those issues and others will be presented in the master plan. The Council has identified the following recommendations and next steps to be performed during Phase II:

Water Demand and Availability

While supplies in the region are relatively abundant, additional analysis is needed to address areas with potential limitations and ensure the long-term sustainability of resources. The next steps can be summarized into two areas:

- Facilitate collection, sharing and analysis of regional data
- Improve understanding of water supply sustainability

Regulatory Process

The Department of Natural Resources (DNR), Minnesota Department of Health (MDH) and Council each play a unique role in the water supply regulatory process. While coordination among these

agencies does exist, there is still potential for improving coordination and streamlining the process. The following is a recommendation that would require legislative action:

RECOMMENDATION #1 - Approve changes clarifying agency roles in water supply plan review and consolidating into one statute the requirements of community water supply plans in the metropolitan area and link water supply planning to comprehensive planning

In addition to the legislative recommendation the following next steps are intended to clarify agency roles and streamline the water supply regulatory process:

- Develop water supply alternatives in areas where resource limitations are identified
- Formalize current Council/DNR community water supply planning review process
- Support the DNR's efforts in streamlining water emergency and conservation plans and implementing the 10- year permit
- Develop a water conservation toolbox to help communities implement best management practices, improve water use efficiencies and meet requirements of the 10-year permit
- Work with the DNR and MDH to develop a single application system for multi-agency water supply system/water appropriation approvals

Safety and Security

State and Federal regulations require communities to identify and establish protocols for dealing with emergency and security issues. There are some aspects of safety and security that can be improved through a regional approach. The following legislative recommendations would improve the safety, security and reliability of the region's water supplies:

RECOMMENDATION #2 - Approve funding for the Minneapolis and St. Paul water system interconnection

In addition to the legislative recommendations above, the following next steps are intended to address safety and security in the region:

- Evaluate and support state/regional activities that improve security and reliability of local water systems
- Support source water protection efforts and impaired waters initiative
- Support sub-regional and regional backups and interconnections

Institutional Arrangements and Funding

There are currently 106 separate water utilities who manage water supplies in the region. There are funding mechanisms in place to finance development of these systems. However, there is currently no funding source for ongoing planning and In order to address potential institutional and funding issues the following steps will be taken in Phase II:

- Work closely with local jurisdictions and the Advisory Committee to explore and identify governance mechanisms to implement needed improvements and programs
- Develop options for ongoing and long-term funding for metropolitan area water supply planning activities and capital improvements

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1. INTRODUCTION

1.1. Background

The seven-county metropolitan area is fortunate to have a relative abundance of high quality water resources. The ample availability of water was very important to the original development of the growth centers of Minneapolis and St. Paul, i.e., the flour mills, breweries, etc. In addition, the water resources of the region have provided the region's residents with a reliable potable water source as well as recreational opportunities and natural amenities. The reliability and availability of water in the metropolitan area are critical to the economic viability of the region and provide a competitive advantage to the region. Protecting this resource and passing it on to future generations is one of the foremost goals of the Metropolitan Council (Council).

COUNCIL POLICIES – Water Supply

- The Metropolitan Council will work with state agencies and communities to promote and support the efficient use of water resources to ensure that supplies are adequate for the region's projected growth.
- The Council will work with regional partners to protect the water supply system for the region.

1.2. Legislative Charge

Minnesota Statutes, Section 473.1565 directs the Council to carry out planning activities addressing the water supply needs of the metropolitan area. The law requires the Council to develop and maintain a base of technical information upon which to make sound water supply development decisions. The Council is also directed to provide recommendations for clarifying local, regional and state governmental roles related to water supply, streamlining the water supply regulatory and permitting process, and the long-term funding of planning activities and capital investment. The findings and recommendations of the initial planning activities (Phase I) are required to be presented in a report to the Minnesota Legislature in January 2007 and subsequent reports must be submitted to the legislature every five years thereafter.

The Council is also required to develop and periodically update a regional water supply master plan. The master plan will provide guidance for local water supply systems and future regional investments. It will emphasize conservation, interjurisdictional cooperation and long-term sustainability; and will address reliability, security and cost effectiveness. The Council anticipates that the master plan will be completed in 2008.

The legislation also established the Metropolitan Area Water Supply Advisory Committee to assist the Council in its planning activities. The Advisory Committee is made up of the following members:

Peter Bell
Peggy Leppik
Gene Hugoson
Gene Buzicky

Chair, Metropolitan Council, Committee Chair
Metropolitan Council District 6, Committee Vice Chair
Commissioner, Department of Agriculture
Department of Agriculture, Alternate

Dianne Mandernach	Commissioner, Department of Health
John Stine	Department of Health, Alternate
Gene Merriam	Commissioner, Department of Natural Resources
Jim Japs	Department of Natural Resources, Alternate
Brad Moore	Acting Commissioner, Pollution Control Agency
Faye Sleeper	Pollution Control Agency, Alternate
Dennis Berg	Commissioner, Anoka County
Joe Harris	Commissioner, Dakota County
Tom Furlong	Mayor, City of Chanhassen
Linda Loomis	Mayor, City of Golden Valley
Barry Stock	City Administrator, City of Savage
Bev Aplikowski	Mayor, City of Arden Hills
Chuck Haas	City Council Member, City of Hugo

1.3. Report Overview

During Phase I of implementing the legislature's directive, the Council began developing a base of technical information including surface water and groundwater availability analyses, water demand projections, water withdrawal and use impact analyses. The Council also evaluated agency roles, the water supply regulatory process and safety, security and reliability issues. This report presents the Council's initial findings and outlines next steps the Council will perform during Phase II, culminating in the preparation of the regional water supply master plan. The methods, data and findings for each of the technical studies performed during Phase I can be found in the companion document, Phase I Technical Report. In addition, the Council, in cooperation with the Metropolitan Water Supply Advisory Committee and other stakeholders, provides the following legislative recommendations:

RECOMMENDATION #1 – Approve statutory changes clarifying agency roles in water supply plan review and consolidating into one statute the requirements of community water supply plans in the metropolitan area and link water supply planning to comprehensive planning

RECOMMENDATION #2 – Approve funding for the Minneapolis and St. Paul water system interconnection

2. STAKEHOLDER WORKSHOPS

Although not specifically required by the legislation, the Metropolitan Council (Council) hosted three public workshops in May and June 2006, during which 115 attendees representing 32 communities and other interested parties shared their views regarding drinking water quality, supplies, safety and security issues and funding. **A central issue that evolved was the link of water supply to overall planning.** Participants discussed the importance of evaluating resources in the context of planned growth to address potential limitations prior to development. During the three workshops, several common themes emerged in five categories:

- **Data and Analysis.** A common theme in the workshops was that the collection, sharing, and analysis of data should be significantly improved, and that doing this on a regional level will result in a more accurate effective and accepted evaluation of resources. A second recurring theme was that entities involved in planning for and/or providing drinking water in the region should define resource availability and sustainability more on a regional basis than a local level so that the cumulative effects of all withdrawals can be evaluated.
- **Regulatory Process.** Another common theme in the workshops was a strong interest in better coordination among the entities that regulate drinking water and development of drinking water resources as well as streamlining the review and approval process. Further, workshop participants were concerned with consistency in the application of regulations among communities. Many participants made a link between regulatory challenges and the need for better data and analysis. They commented that an improved understanding of the available resources and impact of withdrawals and development of alternatives where limitations exist prior to growth will go a long way to alleviating many of the regulatory headaches communities have encountered.
- **Water Conservation.** Workshop participants were concerned about lack of consistency in water conservation activities and requirements throughout the region. Participants indicated that individual local governments and utilities would be wise to integrate water conservation into overall planning efforts.
- **Safety/Security/Reliability.** Workshop participants consistently expressed concerns about the availability and adequacy of water system interconnections or other backup systems needed to ensure reliable water supply delivery, particularly in times of emergency. Protecting the water quality of our resources and ensuring that communities can provide a safe and reliable supply of water of high quality was the other primary concern expressed in the area of safety, security and reliability.
- **Funding.** Funding was consistently identified as a major constraint and a common concern of workshop participants. Participants had a variety of opinions as to who should bear the brunt of funding improvements or programs that would improve regional water supply reliability and sustainability.

Input received during the workshops validated the objectives of the legislation and provided valuable input to the Advisory Committee and Council that was useful in refining the focus of technical and other studies that will take place during Phase II. Additional information related to the three workshops and each of the themes identified above, can be found in the Phase I Technical Report which is a companion document to this report.

3. WATER DEMAND AND AVAILABILITY

Minnesota Statute, section 473.1565 requires the Metropolitan Council (Council) to develop and maintain a base of technical information needed for sound water supply decisions. In order to begin developing this information and evaluating the long-term sustainability of water supplies in the metropolitan area, an analysis of current and future water demands, supply systems and available resources was conducted.

3.1. Water Supply in the Region

In the metropolitan area at least some portion of 121 communities are supplied by 106 separate water utilities. Both groundwater and surface water serve as sources for municipal and other water supply demands in the region. Figure 1 shows the communities with at least a portion of their area supplied by municipal water and their primary source of water supply. In addition to municipal supply, groundwater and surface water are appropriated in the region for other uses such as industrial processing, irrigation, power generation, water level maintenance and air conditioning.

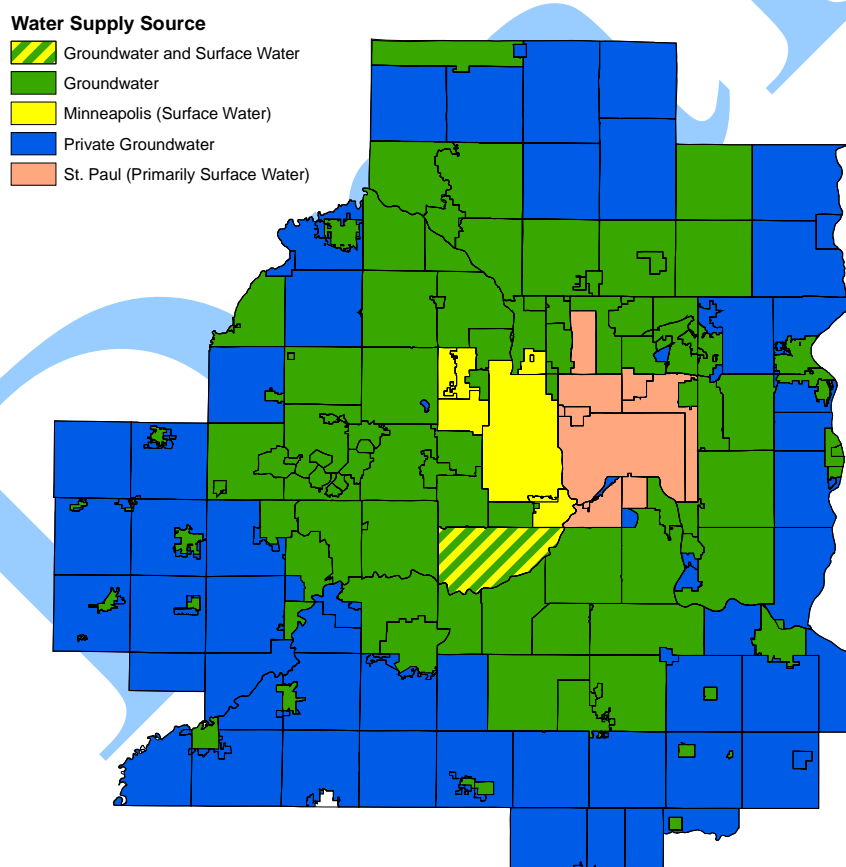


Figure 1. Metropolitan Area Water Supply Source

3.2. Water Demand

In 2004 the population of the metropolitan area was nearly 2.8 million. Approximately 163 billion gallons of water (445 million gallons per day (MGD)) was used in 2004 for residential commercial and industrial needs. Between 2004 and 2030 the metropolitan area population is projected to increase by about 33%, reaching nearly 3.7 million. The population is forecasted to grow nearly 4.5 million by 2050, just over a 60% from the 2004 population.

Based on population forecasts, the Council has projected municipal water demands to increase by approximately 27% from 2004 to 2030, while total water demand during that period is projected to increase only by 16%¹. Total water demand is projected to increase by 35% from 2004 to 2050.

Through 2030, the largest total increases in demand are projected for the areas supplied by Minneapolis and St. Paul Regional Water Services, followed by a number of rapidly growing suburbs and growth centers. Little increase or even small decreases in total demand are projected for many older suburbs and most rural areas. This general pattern is expected to continue through 2050. Figure 2 shows average water demands in 2004. Figures 3 and 4 show projected demands for 2030 and 2050, respectively.

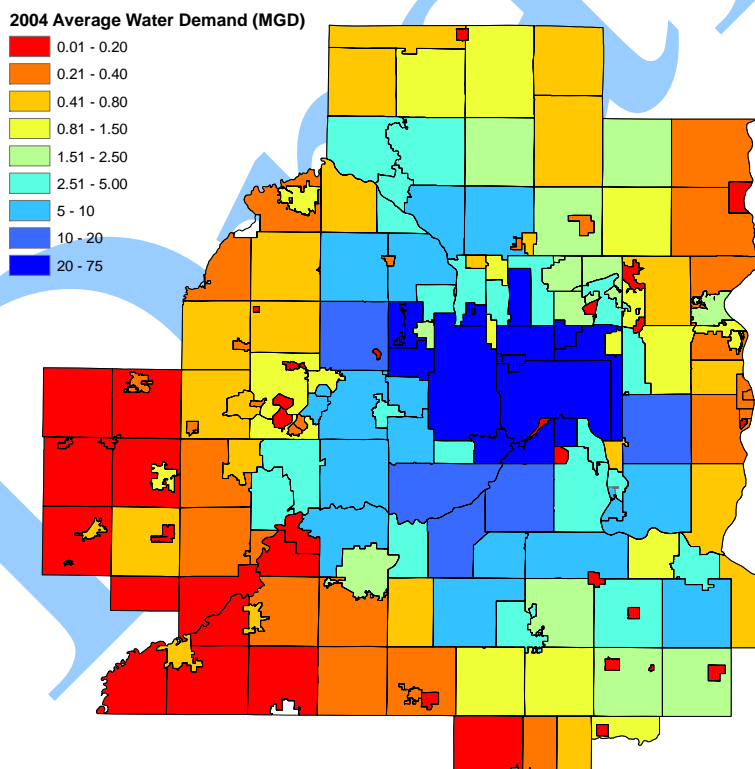


Figure 2. 2004 Water Demand

¹ The differing percentage is accounted for by a number of non-municipal water appropriation permits that are projected to terminate between 2004 and 2030 including some quarry dewatering operations, once through air conditioning permits and irrigation permits.

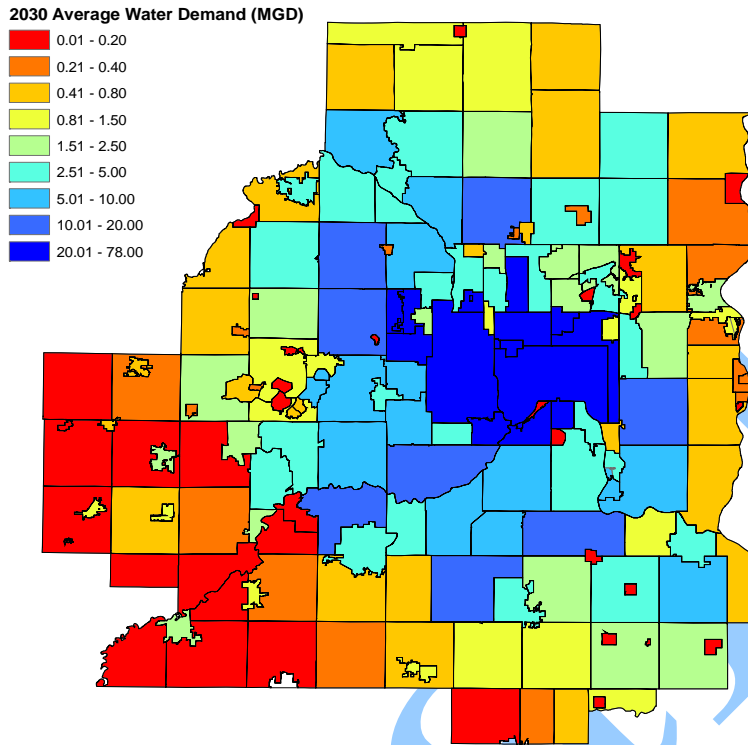


Figure 3. Projected Water Demand 2030

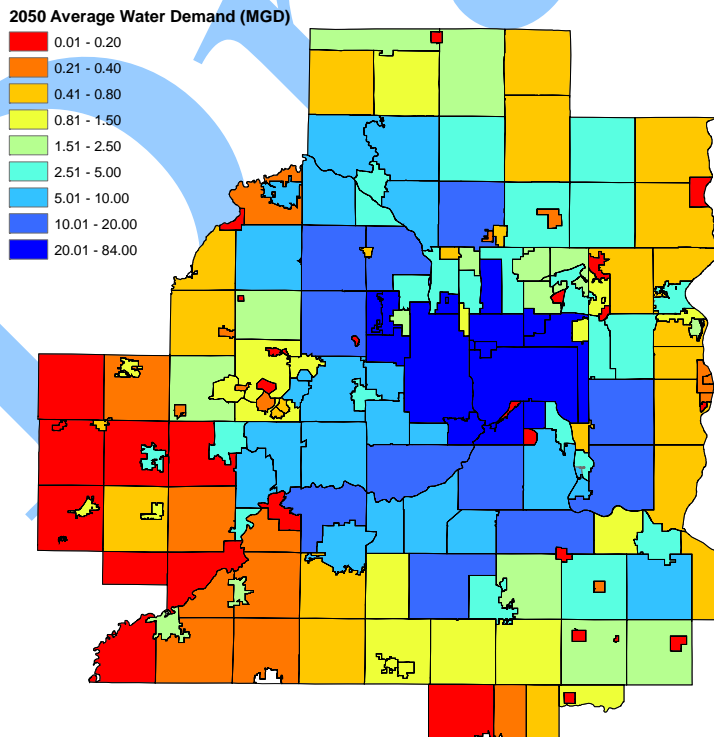


Figure 4. Projected Water Demand 2050

3.3. Surface Water Availability

Sixteen communities in the Twin Cities area are served primarily by surface water through the Minneapolis Water Works or the St. Paul Regional Water Service (SPWRS). The Mississippi River is the sole source of water supplied through the Minneapolis Water Works who supplies 5 other communities on a wholesale basis in addition to the City of Minneapolis. The City of Bloomington also receives water from the Minneapolis Water Works but has its own groundwater system as well. While the SPWRS obtains about 70 percent of its water from the river, the remainder comes from four high-capacity groundwater wells, the Rice Creek Chain of Lakes (Centerville Lake) and tributaries to Vadnais Lake. The SPRWS supplies water to a total of 10 communities, including St. Paul, on either a wholesale or retail basis. The total population (2004) that relies at least in part on surface water in the region is estimated to be about 970,000.

In addition to providing water for the two water supply systems, the Mississippi River is also a source for once through cooling at two power plants along the river and is used for navigation on a regular basis. When determining the availability of drinking water from the Mississippi River, these other uses must be taken into consideration.

3.4. Surface Water Limitations

Potential limitations of the Mississippi River include contamination and drought. The Metropolitan Area Short-Term Water Supply Plan, prepared by the Council in 1990, focused on flow considerations for the Mississippi River in the metropolitan area. In that report minimum flows of 554 cubic feet per second (cfs) and 132 cfs at Anoka were established as the critical flow and emergency flow, respectively, for water supply, power generation and navigation (see sidebar). These minimum flows assume that the communities relying on the river as a source of drinking water would reduce use through conservation measures during a high demand summer period.

Recent information indicates the average daily demand for the SPRWS has ranged from 45.7 to 58 MGD between 1978 and 2005 with the average for the period being 53 MGD. The Minneapolis Water Works average day demand ranged from 60 to 81.4 MGD between 1988 and 2004. Therefore, a slight revision to the critical

MINIMUM FLOWS AT ANOKA

Critical Flow

The critical flow of 554 cfs is broken down as follows:

Minneapolis	132 cfs (85 mgd)
St. Paul Regional Water Services	70 cfs (45 mgd)
Power Plants	2 cfs
Navigation	225 cfs

Emergency Flow

An emergency flow level of 132 cfs is defined as:

Minneapolis	132 cfs (85 mgd)
St. Paul Regional Water Services	Other sources
Power Plants	Can reduce to 0
Navigation	Can do without in emergency

flow could be made, however the values are still within reason.

Because the Minneapolis Water Works obtains all of its water from the Mississippi River with no current alternative the entire 85 MGD would need to be withdrawn from the River. The SPRWS has significant volume available from the Vadnais Chain of Lakes and its supply wells. In a typical year approximately 70% of the water treated by the St. Paul Regional Water Service is from the Mississippi River with the rest split between wells and the local watershed runoff. However, in a drought year, little water would be contributed by the watershed. The SPRWS estimates that it has approximately 60 days of 'practical supply' in the reservoir system. The SPRWS is in the process of installing wells with sufficient capacity to supply their average day demand. The wells are expected to be completed by 2009. For planning purposes, the Short-Term Water Supply Plan suggested that it would make 'good resource sense' to continue withdrawing from the Mississippi River as long as that source was available and use its back up supplies only when necessary. Therefore, in the determination of the critical flow it was assumed that the SPRWS withdraw 45 MGD from the River to supply its demands.

In addition to low flows, contamination can be a limiting factor for surface water suppliers. This is addressed further in the Safety and Security section of the report.

3.5. Groundwater Availability

Approximately two-thirds of the total non-power generation water consumed in the metropolitan area is from groundwater sources. The region is fortunate to have a relative abundance of available groundwater. However, productive aquifers are not evenly distributed across the region. In addition, potential impacts to surface water resources from groundwater withdrawals limits groundwater use in some areas. Groundwater contamination can also limit supplies or significantly increase the cost of obtaining useable water.

Figure 5 is a schematic cross section or profile of the aquifers in the Twin Cities basin. The Prairie du Chien-Jordan aquifer system is the most heavily used and most productive. Approximately 60% of ground water used originates from this aquifer system. Due to the nature of the geology of the Twin City basin, the prolific Prairie du Chien-Jordan aquifer system is not present in much of the northern and western portions of the region.

The aquifers available in these areas include the unconsolidated sand and gravel aquifers, the Franconia-Ironton-Galesville (FIG) aquifer system and the Mt.Simon-Hinckley aquifer system. In some areas the unconsolidated aquifers produce significant quantities of water. However, these aquifers are highly variable and are generally more susceptible to contamination. The FIG aquifer is used in many areas of the region. Although there are some relatively high capacity wells in the FIG aquifer, its potential yield is highly variable and generally lower than the Prairie du Chien-Jordan.

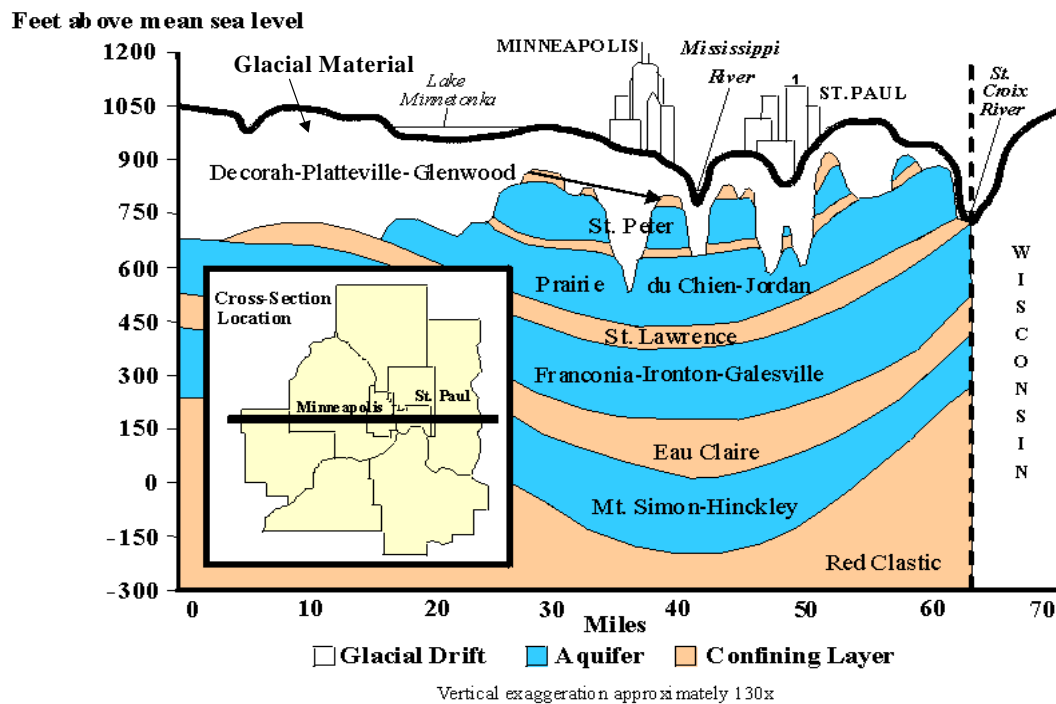


Figure 5. Generalized Twin Cities Metropolitan Area Geologic Cross-Section

The Mt. Simon-Hinckley aquifer system is also a potential source for water in the region; however, legal limitations have been imposed on its usage. Minnesota Statute, section 103G.271 subdivision 4a does not allow new appropriation permits for water from the Mt. Simon-Hinckley aquifer unless there are no feasible or practical alternatives to this source and only if it is appropriated for potable use. This limitation was imposed in response to concerns that appropriations exceeded the sustainable yield due to observed declines in the aquifer, and to preserve this deepest bedrock aquifer for the long term.

As part of the Phase I analysis, each community or group of communities relying on the same water source(s) was evaluated on the basis of available aquifers. For the purposes of this evaluation, the Mt. Simon-Hinckley aquifer system was not considered due to the restrictions on its use. Unconsolidated aquifers not currently used were generally not considered because the extent and potential yield of these aquifers is not well known. A semi-quantitative scoring system was developed that considered factors including presence/extent of each aquifer, geologic influences on potential recharge, observation well trends, and capacities of existing wells.

The result of the evaluation is a relative ranking of expected aquifer potential for each area. This result is mapped in Figure 6. The map identifies communities where the Prairie du Chien-Jordan aquifer system is expected to have high to very high relative potential yields. A very productive sand and gravel aquifer in northern Hennepin County (Maple Grove, Osseo, and Brooklyn Park) also influenced the results. Several areas of possibly limited potential yield were identified. In these areas the Prairie du Chien-Jordan aquifer system is absent, the FIG aquifer system is not expected to be highly productive, and unconsolidated aquifers are likely limited or absent. Other communities could also encounter water supply limitations, depending on water demand growth.

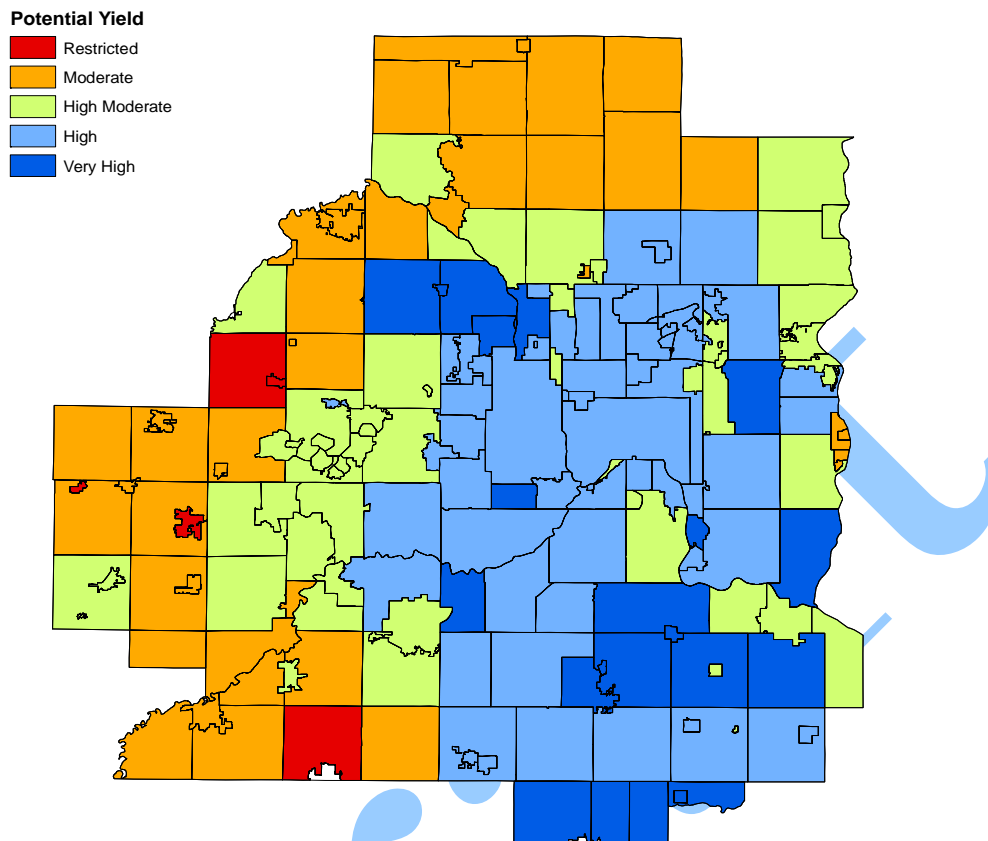


Figure 6. Aquifer Availability

3.6. Groundwater Limitations

The sustainable yield of the aquifers may also be limited or inhibited by several factors including potential impact of withdrawals on surface waters, groundwater contamination, well interference and limited recharge.

Impact of Groundwater Withdrawals on Surface Waters

Two types of surface water features that are particularly dependent on groundwater inflow are trout streams and calcareous fens. Trout streams and calcareous fens each are home to rare or highly valued biotic communities that, in the metro area, rely on a steady inflow of ground water. Under the provisions of *Minnesota Statutes*, section 97C.005 (trout streams) and section 103G.223 (calcareous fens) these water are specially protected. There are 16 designated trout streams and 15 known calcareous fens in the Twin Cities area. All of the calcareous fens and 13 of the 16 trout streams occur along the Minnesota and St. Croix river valleys.

Some other waters designated as Department of Natural Resources protected waters are directly or indirectly connected to the shallowest major aquifer. Trout streams, calcareous fens, and some other streams, wetlands, and lakes could be negatively impacted by ground-water withdrawals.

Surficial geology, land-surface elevation, bedrock geology, and aquifer water levels or pressures were used to identify areas where withdrawals from a major aquifers may influence surface waters (Figure 7). It should also be noted that groundwater withdrawals need not occur within the identified areas to influence surface waters. Ground-water withdrawals outside the sensitive areas could have an influence if the withdrawals result in reduced shallow groundwater levels beneath the sensitive water body. The impact of groundwater withdrawals on surface water features is not well quantified in most areas of the Twin Cities, and water appropriations applicants to demonstrate that a proposed appropriation would not impact surface water resources before an appropriations permit is issued.

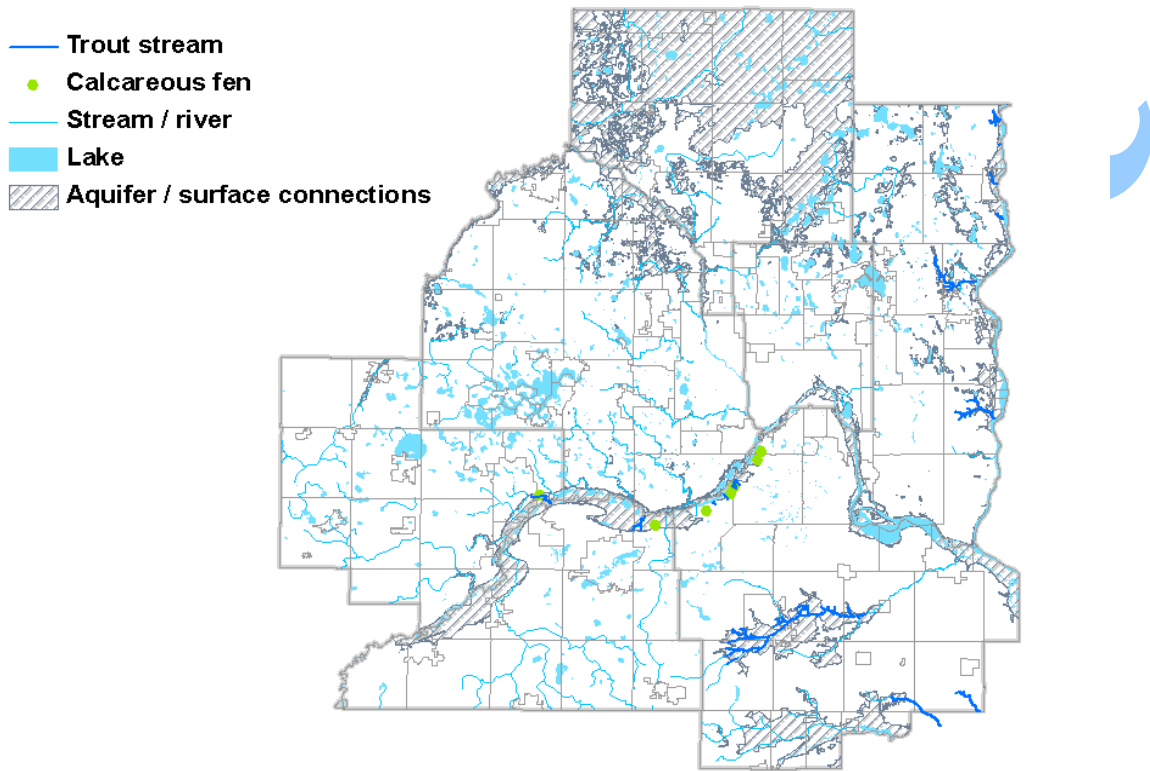


Figure 7. Surface Water Under the Influence of Groundwater

Groundwater Contamination

As discussed above, groundwater quality problems can limit the availability of water or increase the costs of securing usable supplies. The relative cost of treatment varies with the type and quantity of constituent(s) to be removed. In general, naturally occurring regulated contaminants such as radium and arsenic and “aesthetic” contaminants such as iron and manganese have not inhibited the development of water supplies.

The seven special well construction areas designated in the metro area and other aquifer contamination areas have not prevented the development of municipal water supplies, although these areas have imposed some limitations or costs. For example, the City of Hastings will treat water supplied by some of its wells to remove nitrate, and the City of New Brighton treats water from

several of its wells for solvent contamination originating at the Twin Cities Army Ammunition Plant in Arden Hills. Restrictions on well construction in special well construction areas will continue. As part of its ongoing analysis, the Council is working with the Minnesota Department of Health and other stakeholders to improve mapping of groundwater contamination in the region. This information will be included in the development of the regional water supply master plan.

Aquifer Recharge

The ultimate source for groundwater supplies is rainfall. The impact of development and actual rates of aquifer recharge are not well quantified in the region. The Council is working with the Minnesota Geological Survey to better understand where and how the region's aquifers are recharged. This information will be included in the development of the regional water supply master plan.

Well Interference

Well interference problems or influence of a high capacity well on other wells resulting in reduced capacity can also be a potential limitation. This however, was not included in the analysis of potential limitations in the region but will need to continue being evaluated on a local system as supplies are developed.

3.7. Integrating Demand and Availability

Each community or group of communities relying on the same water source(s) was evaluated on the basis of projected changes in water demand, relative aquifer potential yield, proximity to calcareous fens or designated trout streams, proximity to other potentially sensitive surface waters, and proximity and extent of special well construction areas or other designated aquifer contamination areas. A scoring system was developed for each category, and each combination of scores was assigned a level of adequacy: uncertain, adequate, or possible excess. It should also be noted that the potential for future appropriations from the Mt. Simon-Hinckley aquifer system was not considered in the aquifer evaluation component, as was explained above

An evaluation of projected 2030 demands relative to potential sustainable yield revealed several areas of uncertainty in terms of the adequacy of local water supplies. The adequacy of available aquifers to meet projected 2030 demands is uncertain for several western and northern metro communities where large increases in population are projected. Impacts to wetlands are also a potential factor that contributes to the uncertainty for communities in Anoka County with the highest projected increases in population. Figure 8 shows the projected adequacy of local supplies based on 2030 forecasts.

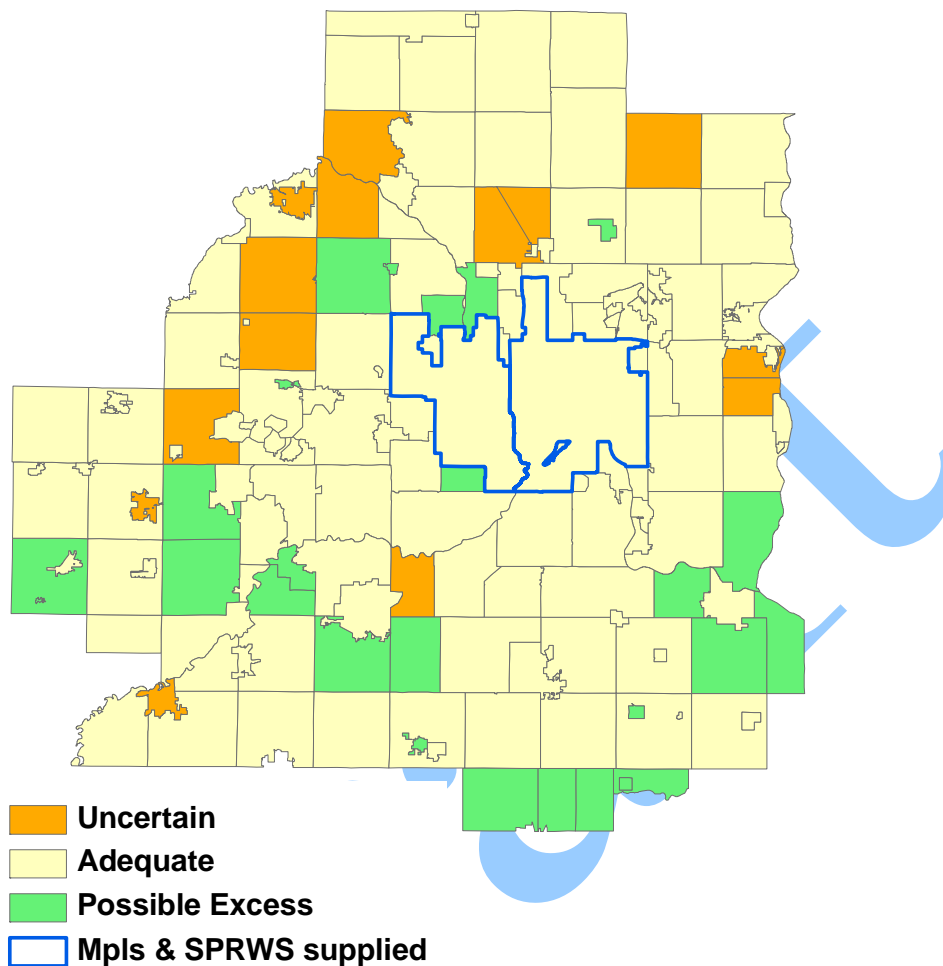


Figure 8. Projected Adequacy of Local Supply 2030

The special well construction area in Baytown and West Lakeland Townships may limit the adequacy of local supply to meet projected demands or raise costs for treatment. Limitations have been placed on the use of the unconsolidated aquifer and the Prairie du Chien-Jordan aquifer system in Savage in order to protect the East and West Branches of Eagle Creek (designated trout streams) and Savage Fen (a complex of calcareous fens). These limitations along with significant projected growth and increases in demand make the adequacy of local ground-water supply uncertain for the City of Savage.

By 2050, a large increase in projected water use, particularly during peak demand periods, leads to some uncertainty in the ultimate adequacy local supply for the City of Lakeville. Significant development and increases in demand and proximity to designated trout streams contribute to uncertainty in the ultimate adequacy local supplies for the cities of Farmington and Woodbury. Potential aquifer limitations and increases in projected demands, particularly during peak demand periods, lead to some uncertainty in the ultimate adequacy of local supply for the City of Carver

It should be noted that limitations on potential water supplies occur in some areas not designated as uncertain on Figure 8. Careful management and optimization of the available resources may be required to meet future demands in many communities where the theoretical potential sustainable

yield is expected to be adequate. For example, impacts to surface waters or well interference resulting from groundwater withdrawals are possible in many areas not depicted on the map. Avoiding these impacts by appropriately placing wells and using all available aquifers may be possible but more expensive or impractical for some water suppliers.

3.8. Summary and Next Steps

In order to evaluate potential limitations on groundwater withdrawals several factors need to be considered. These include projected demands, the productivity of the groundwater system, limitations on withdrawals for the protection of surface waters, and cost restrictions or other constraints related to water quality. Of particular interest is identifying areas where total local supply may not be able to meet future demands. Also of interest is identifying areas where increases in demand will require that resource availability and limitations be better understood and quantified in order to ensure future demands can be met without adverse impacts.

During Phase I, the Council evaluated projected 2030 and 2050 water demands relative to potential sustainable yield to identify areas of greatest concern. However, the Council will continue evaluating and addressing potential supply limitations in Phase II and will undertake a number of efforts including the following.

- **Evaluate resource limitations and adequacy and sustainability of water resources**
While a number of technical studies were performed during Phase I, ongoing and more detailed efforts are necessary to adequately evaluate the long-term sustainability of the region's resources and develop alternatives where limitations exist. The results of these efforts will be used in the development of the regional water supply master plan. Those studies include:
 - Improve the scientific understanding of the groundwater flow system and impact of projected withdrawals with a focus on areas of concern
 - Continue to evaluate aquifer recharge and the impact of land use changes on groundwater supplies
 - Continue to map groundwater contamination in the region
 - Refine the water demand projections in areas of concern
 - Refine the estimate of sustainable withdrawal from the Mississippi River for municipal water during low river flow conditions
 - Evaluate the potential impacts of conservation programs on projected water demands

- **Facilitate collection, sharing and analysis of regional data**
 - Continue to utilize regional and sub-regional task forces to review limitation issues
 - Encourage data collection standardization
 - Update regional groundwater models and datasets
 - Expand the regional water supply data base to include water use data and develop the tools needed to evaluate water use on a regular basis
 - Make available the water resource monitoring database developed in Phase I and address gaps in the monitoring network.

4. WATER SUPPLY REGULATORY PROCESS

Minnesota Statute, section 473.1565, requires the Metropolitan Council (Council) to provide recommendations that would clarify agency roles and streamline the water supply regulatory process. During Phase I, the Council conducted an evaluation of the regulatory process and agency roles. The initial evaluation also included collecting input from stakeholders on their views on regulatory issues and potential improvements. During the workshops conducted as part of the Phase I planning activities, several attendees commented that there is a need for better coordination among the agencies responsible for water supply oversight. Participants also commented that they have experienced delays during the water appropriations permitting process or that they received final permit approvals only to have unforeseen restrictions placed on their system or well after approval.

4.1. Current Regulatory Process

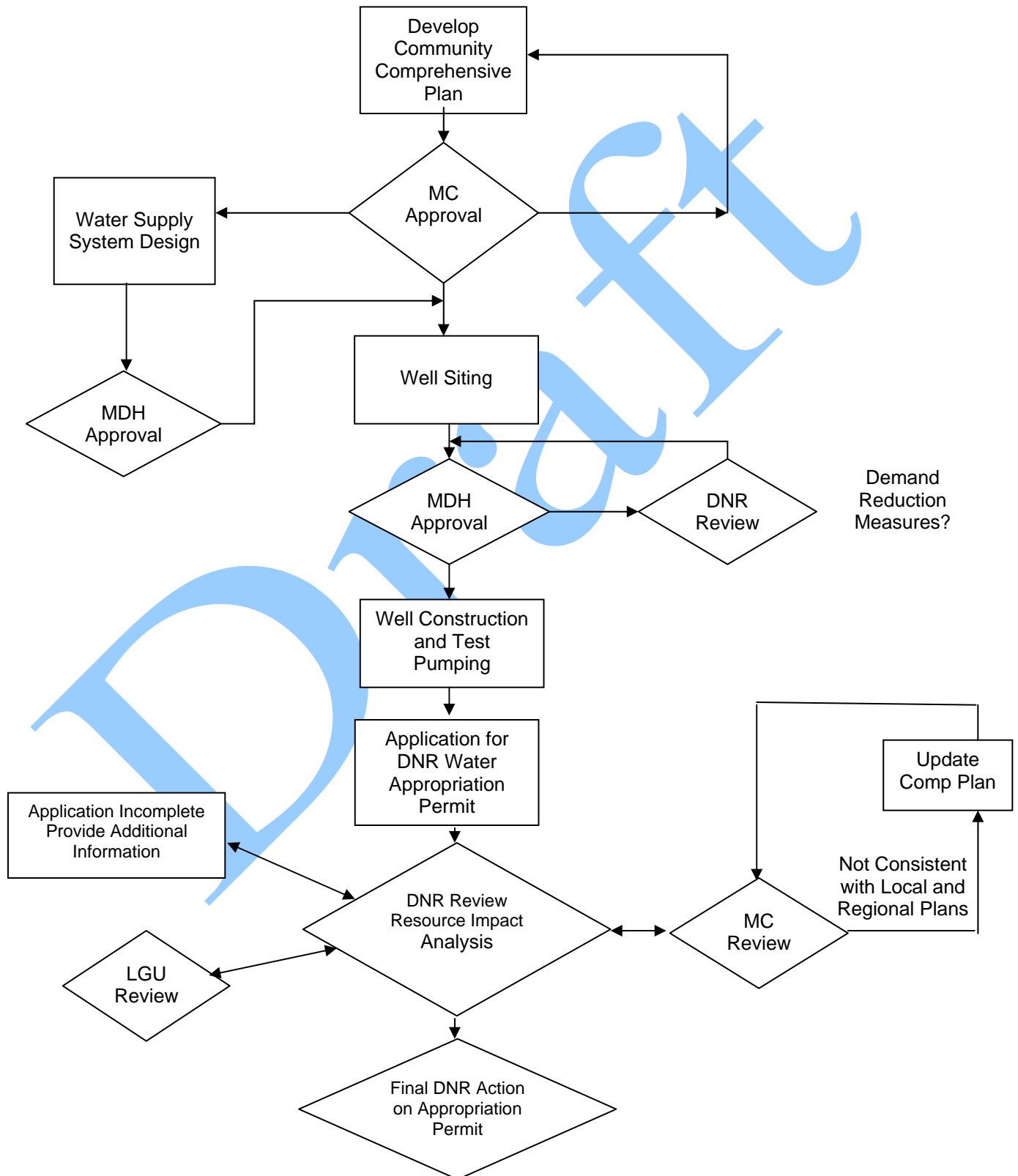
Each agency responsible for water supply planning oversight has a unique role and perspective. The Minnesota Department of Health (MDH) ensures compliance with the Safe Drinking Water Act and State well code while the Department of Natural Resources (DNR) permits withdrawals and protects the state's natural resources, Minnesota Statutes, 103G.265, subd. 1. The Metropolitan Council ensures the orderly and economic growth of the region.

When developing or expanding a water supply system, communities must seek approvals from the MDH and DNR. Prior to these approvals, communities in the metropolitan area are required to prepare a water supply plan as part of their local comprehensive plan, which are reviewed by the Council. These plans also meet the DNR requirements for an emergency and conservation plan, which all suppliers serving over 1,000 people statewide are required to submit.

Following preparation of the water supply plan, the engineering plans are sent to the MDH. The MDH performs a detailed review of these plans and performs a location siting review for the proposed treatments and/or wells. During review of the well construction plans MDH contacts the DNR to ensure that the community has adequate demand management measures in place. Finally for new wells, the well is constructed and tested following the location siting review. The next step a community takes is requesting a permit for water appropriations from the DNR. During this step, the DNR conducts a resource impact analysis prior to consideration of final permit approval. The Council reviews the appropriation request for consistency with local and regional plans.

Metropolitan Area
 Water Supply Well Approval Process
 Municipal Well

Figure 9. Current Regulatory Process



4.2. Permitting Issues and Agency Coordination

A central issue that has been repeatedly raised is the lack of a thorough analysis of available supplies and potential resource impacts or limitations prior to growth to guide the siting of new wells and water systems. This situation has been an underlying reason for appropriation delays and limitations in many cases. The regional availability of roads and sewer service to a development site is always evaluated but no similar assessment related to water supplies is typically conducted. This lack of regional water source analysis has also led to limitations or restrictions on withdrawals as wells are sited in increasingly resource-limited areas. A recent example is in the City of Woodbury where concerns were raised regarding the potential impacts of withdrawals on trout stream and private wells from a well field planned to serve projected growth. As a result, the city has undertaken significant monitoring and analysis and may have to develop supplies in locations further from the developing areas which will result in increased capital expenditures.

Exacerbating the problem is the fact that water suppliers typically apply to the DNR for an appropriations permit only after a new well is installed. In order to evaluate potential impacts to other water users and natural resources, the DNR requires well performance information (e.g., drawdowns, sustainable flow rate) that can only be obtained after installation. The impact of the current process is that in order to apply a permit, a significant capital investment has already been made by the community and the demand for water is already there making delays and restrictions particularly aggravating for all parties involved.

Other situations which have caused delays include a lack of water conservation programs, incomplete application, water demand forecasts inconsistent with local comprehensive plan or Council forecasts or DNR staff workload issues.

Currently, the MDH, DNR and Council do coordinate during the regulatory process. When new wells are sited by the MDH, they notify the DNR and request confirmation that demand reduction measures are in place as required by Minnesota Statutes, 103G.291. There is currently an informal process for review of the DNR Emergency and Conservation Plan and Council Water Supply Plan. DNR's Emergency and Conservation Plan also satisfies requirements for MDH's Well Head Protection Plans and Drinking Water Revolving Loan application requirements. However, there is room for improvement in coordination amongst agencies which will be a benefit to both the local communities seeking approvals as well as the agencies providing oversight.

4.3. Streamlining the Process and Clarifying Roles

The Council, DNR, MDH and most other stakeholders agree that the current Council led water supply planning effort will go a long way toward addressing many of the issues that have led to delays in the permitting process. The overall goal of evaluating available resources and developing alternatives in the context of projected growth will address the potential resource impacts which have led to permit delays in the past.

In addition to the overall planning, several administrative changes to improve coordination among

the agencies will help streamline the process. Specifically, developing a process allowing for a well location approval request to include a water appropriation request will help to simplify the process. Similarly, developing a process so that one well log is submitted to the state and the agencies coordinate distribution will reduce submittals. Currently a well log is submitted to both the MDH and DNR following construction for different purposes.

Another part of the process that can be streamlined through administrative and legislative means is the water supply/emergency and conservation plan review. The fact that there are two different statutes which have requirements for the plan(s) has caused confusion in the past. In addition, currently the submittal schedule for the two plans is not concurrent. A legislative change consolidating the requirements, clarifying the review roles and aligning the schedule will remove confusion from the process. The Council and DNR do currently have an informal agreement for coordinating plan review so that communities within the metropolitan area can submit one plan to meet both requirements and one set of comments is delivered. This agreement should be administratively formalized.

Another aspect of the Council's overall planning effort is developing a water conservation toolbox that will assist communities in meeting the water conservation requirements for appropriation permits as discussed below. In the past, a lack of water conservation programs has led to delays in permit issuance.

One further step toward streamlining the process is the integrated 10-year permit plan already developed by the DNR and is discussed in the following section.

4.4. Integrated 10-Year Permit-Plan

The DNR recently developed a more flexible approach to appropriations, attempting to integrate water supply planning, permitting and water conservation and as well as to help resolve some of the problems with the existing process (see the attached document Water Emergency and Conservation Plans and Water Appropriation Permit Approvals). Under the "permit-plan" concept, in conjunction with approval of an updated water emergency and conservation plan, a community can apply for pre-approval of its 10-year water appropriations. As a condition of approval of such a permit, a community is required to meet certain water conservation benchmarks. If such benchmarks are not met, it must then commit to implementing a series of water conservation measures and programs intended to address any shortfalls defined for each benchmark. The water conservation benchmarks in this regulatory concept included in the 10-year permit-plan program are described in the Phase I Technical Report. The benchmarks include:

- Residential per capita demand **<75 gallons/capita/day**
- Unaccounted/Unmetered **<10%**
- Average day to peak day demand ratio **<2.6**
- A water conserving or "conservation neutral" rate structure
- An approved monitoring plan
- Mitigation efforts related to resource impacts or limits

4.5. Water Conservation – Development of a Water Conservation Toolbox

Minnesota Statutes, Sections 103G.291 and 473.859 require metropolitan area communities with municipal water supply systems to document water conservation programs as part of their water supply plan/emergency and conservation. Specifically, the statutes require communities to have an education program and to evaluate water conservation rate structures.

Currently, nearly every community in the metropolitan area uses some type of public outreach to educate its customers on how they can conserve water and the benefits of doing so. All but two communities use conservation rate structures. Conservation rate structures incorporate the cost-of-service principals and motivate customers to reduce wasteful water use through increasing block or seasonal rates. Many communities have also implemented water restrictions to offset their peak day demands during the summer months. Other conservation programs used in the region include tree preservation and landscaping ordinances, topsoil preparation regulations and appliance retrofit programs

As mentioned above, in order to qualify for the 10 year permit option, a community either has to meet the specified benchmarks or commit to certain water conservation programs aimed at addressing the benchmark categories. In addition, the DNR requires that communities have water conservation programs in place prior to requesting additional water appropriations (for permits not requested under the 10 year permit).

As part of Phase II activities the Council is planning to develop a water conservation toolbox to assist communities in meeting the water conservation programs in the 10 year plan requirements. In addition, the water conservation tools can be used by communities who are not pursuing the 10-year permit to reduce demand and meet the current requirements for an appropriation permit.

The conservation toolbox will include such things as model ordinances, ideas for media campaigns and education materials for communities to use. In addition to providing resources for communities, the toolbox will also include resources for residential, commercial, industrial and institutional customers interested in reducing their water use.

4.6. Summary, Next Steps, and Recommendations

As discussed above, several administrative and legislative changes will streamline the regulatory process and clarify roles of the agencies involved. Specifically the Council will work with the DNR and MDH to implement the following administrative improvements.

- Develop water supply alternatives in areas where resource limitations are identified
- Formalize current Council/DNR community water supply planning review process
- Support the DNR's efforts in streamlining water emergency and conservation plans and implementing the 10-year permit

- Develop a water conservation toolbox to help communities implement best management practices, improve water use efficiencies and meet requirements of the 10-year permit
- Work with the DNR and MDH to develop a single application system for multi-agency water supply system/water appropriation approvals

In addition to these changes the Council recommends the following:

RECOMMENDATION #1 - Approve changes clarifying agency roles in water supply plan review and consolidating into one statute the requirements of community water supply plans in the metropolitan area and link water supply planning to comprehensive planning

5. SAFETY AND SECURITY

Minnesota Statutes, section 473.1565 requires the Metropolitan Council (Council), in preparation of the water supply master plan, to address the reliability, security and cost-effectiveness of the metropolitan area water supply system. Information on current safety and security measures in the region was collected during Phase I. Participants of the workshops held by the Council throughout the region noted the need for backup supplies and supply redundancies and protection from contamination.

Drinking water supplies have long been recognized as vulnerable from intentional, accidental, or natural events. Recent events such as 9-11, the 2003 East Coast power outages, and hurricanes in the Southeast have further exposed the vulnerabilities of water systems and raised awareness of drinking water utility safety and security issues. The Council has identified the following as the most significant risks that could affect the region: contamination (both intentional and accidental in both the distribution system and the source water), loss of power and natural disasters. These concerns were reinforced from attendees of the workshops.

The distribution system is most vulnerable to intentional contamination due to:

- large number of access points
- ease of access
- inability to detect contamination in a timely manner

5.1. Federal Regulations and Programs

Bioterrorism Act

There are several Federal regulatory requirements and programs related to drinking water safety and security. The most important of these is the Bioterrorism Act of 2002, which was enacted in response to the events of 9/11. The Bioterrorism Act requires water utilities serving more than 3,300 people to conduct vulnerability assessments (VAs) of their systems and develop emergency response plans (ERPs). VAs determine how vulnerable the system is to terrorist or other intentional attacks that would disrupt the water supply or make the water unsafe to drink or use. ERPs are required to include procedures to mitigate impacts of potential attacks identified in the VAs.

The Bioterrorism Act requires utilities serving over 3,300 people to conduct vulnerability assessments (VAs) of their systems and develop emergency response plans (ERPs).

Other Federal Requirements

Homeland Security Presidential Directive Number 5 (HSPD-5) requires water systems to follow National Incident Management System (NIMS) requirements. NIMS is designed to provide consistent emergency response organization and terminology, as well as to train those who respond to incidents. To be eligible for federal grants, water system staff must be trained in NIMS procedures and requirements.

HSPD 7 and HSPD 9 require programs be developed to protect critical infrastructure in industries like water supply from terrorist attack. Currently, the EPA is in the process of implementing HSPD 7 and 9 for water systems including developing strategies for responding to and preparing for incidents, promoting information exchange among stakeholders, and developing and using technological advances in water security. Included is the development of a Contamination Warning System (CWS) for early detection and awareness of disease, pest, or poisonous agents and development of a nationwide laboratory network for identifying such agents using existing federal and state laboratory resources.

Pending Security-Related Regulations and Programs

DHS recently announced the completion of the National Infrastructure Protection Plan (NIPP), the much-anticipated document that outlines a comprehensive all-hazards risk management framework designating critical infrastructure protection roles and responsibilities for government and private industry. Amendments to the Homeland Security spending bill passed by the U.S. Senate would create a chemical security program at DHS which could require security enhancements or alternative less-hazardous chemicals or systems for commonly used water industry chemicals like chlorine gas or anhydrous ammonia.

Best management practices for security are continuing to evolve which will help utilities define the level and types of security programs to implement. One method that can be used to help define best management practices is the Water Infrastructure Security Enhancement (WISE) Consensus Standards which were developed by AWWA, ASCE and WEF.

The EPA is developing a system for timely detection and response to drinking water contamination incidents called the WaterSentinel Program. It uses multiple triggers as potential indicators of contamination to increase chances of detection.

5.2. Regional and State Regulations and Programs

General planning for handling water system emergencies has always been the responsibility of local water utilities. Emergency planning became more formalized in 1995, when state legislation required all water suppliers serving over 1,000 people (and all water suppliers in the metropolitan area) to prepare a water system emergency preparedness plan. For many utilities, this was their first effort at writing down emergency procedures. These plans must be updated every ten years.

One significant element of Minnesota's emergency planning requirements outlined in state statute is the establishment of a priority system for rationing water in the event of an emergency. Every water supplier must develop triggers for initiating demand reduction measures consistent with these water use priorities. The plan also is required to identify alternative water sources available in the event of shortage.

Many water utilities have implemented security system enhancements at critical facilities in response to the VAs. In addition to upgrades to address intentional, malevolent acts, water utilities have implemented a variety of other enhancements to address natural disasters and unintentional events. For example, many water utilities have increased backup generator capacity or developed hydraulic models of the distribution system to optimize storage and reduce the consequences of power loss. Some systems have developed source water contamination monitoring systems to reduce the risk of water

The scope of security programs varies for large metropolitan areas. Best management practices for security are continuing to

contamination from the source water supply - most common for river water supplies. Utilities have also developed mutual aid agreements with surrounding communities and local businesses to provide equipment, supplies, and alternate water during an emergency.

5.3. Backup Supplies and Interconnections

A majority of metropolitan area communities have at least one emergency connection with a neighboring community. Most of the connections are relatively small diameter pipes and the water available during an emergency is only enough to augment supplies, not completely replace them. Most communities have contingencies which include requesting assistance from the National Guard and distributing bottled water to residents.

The two largest suppliers, the City of Minneapolis and the St. Paul Regional Water Services do not have an interconnection with each other and interconnections with other smaller communities would not provide much backup.

Since the 1930s, officials in both cities and water systems have recognized the value of connecting the two systems so one could provide ongoing, emergency water to the other should the need arise. Historically, the project has had only one of the two parties interested at any given time. Both systems are well suited to supplement the needs of the other, but now simply lack the facilities to transfer the water.

Prior to the 2005 legislative session, the state Health Department and the Metropolitan Council recommended to the Governor that a \$10 million bonding item be included in the state capital appropriation. This amount would augment similar amounts to be contributed by the two water utilities. The Governor's recommendation was to wait for the Council's water supply study and this report to the legislature to reconsider the matter. The Council's evaluation thus far finds a strong regional interest in supporting backup supplies for suppliers in the region and reconfirms the benefits to the region and state as a whole of such a measure in the event of an emergency shutdown of either major city's water system.

The total population served by the Minneapolis (not including Bloomington) and St. Paul systems is approximately 466,000 and 415,000, respectively. Loss of water at either system would have a severe economic impact on the metropolitan area, and the state of Minnesota as a whole. Based on various assumptions, a temporary disruption (one week) of all economic activity would affect:

- Up to 342,200 jobs in Minneapolis and five other cities using Minneapolis water, with a payroll of up to \$78.8 million per week and total economic activity of up to \$382.1 million per week.
- Up to 289,600 jobs in St. Paul and nine other cities using St. Paul water, with a payroll of up to \$62.0 million per week and total economic activity of up to \$274.9 million per week.

Other impacts that can not be quantified would occur, such as:

- Loss of property due to fire, as the absence of water supply would totally eliminate fire protection for businesses and homes.
- The need to supply over 400,000 persons in each of the two systems with potable water for the following which could adversely affect public health:

- drinking and cooking
- human waste disposal
- basic hygiene and food preparation,

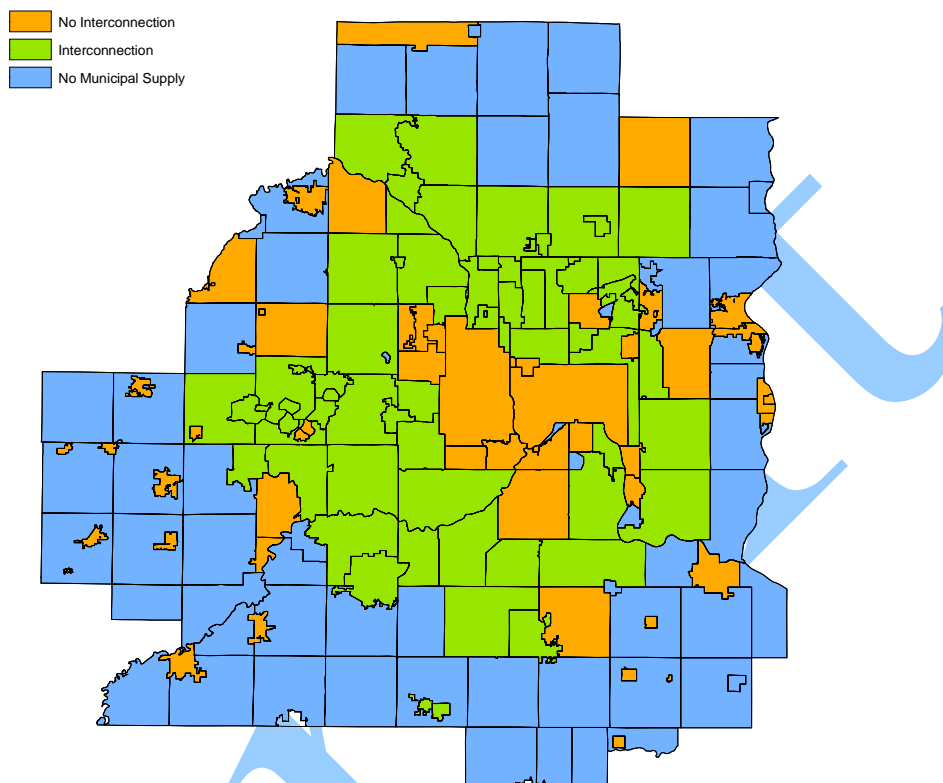


Figure 10. Water Supply System Interconnections

5.4. Source Water Protection

Each public supply using groundwater in the state is required to prepare and implement wellhead protection plans to protect supplies from contamination. Surface water suppliers are not required to prepare plans. However, the cities of Minneapolis, St. Cloud and the St. Paul Regional Water Services have teamed up to prepare plans voluntarily. The challenge these suppliers face is implementing resource protection measures in the area that supplies water to their systems which is nearly entirely outside their jurisdictions.

The analysis in Phase I made clear the connection between stormwater management efforts and goals of sourcewater protection for the surface water suppliers. The Clean Water Legacy Act was passed in 2005. Additional funding for these programs will improve water quality and help to protect the water supplies for over 900,000 people in the region.

Another aspect of protecting surface water supplies is spill response. Currently several entities have responsibility for cleaning up spills in the state. These include counties, MPCA, local fire departments and private entities. In the mid-1990s an effort to coordinate spill response in the area

upstream of the Minneapolis, St. Paul and St. Cloud water supplies resulted in the River Defense Network. While much of the spill response equipment is still in place from that effort, there is a need to evaluate the necessary additional training or coordination of responders.

5.5. Summary and Next Steps

A variety of requirements and programs address water supply safety and security. Emergency response planning is primarily the responsibility of the water utility. Many suppliers have some emergency interconnections with adjacent communities. An interconnection between the Minneapolis Water Works and the St. Paul Regional Water Services would provide a regional benefit.

In an effort to help communities provide safe and reliable water to their customers the Council is planning to undertake the following activities in Phase II.

- Evaluate and support state/regional activities that improve security and reliability of local water systems
 - Support the development of the state and interstate WARN program
 - Track the development of emerging security standards and programs such as the WISE standards and WaterSentinel Program and determine the applicability to the regional planning effort
 - Evaluate the need for training programs for water suppliers in the region and development of recommendations for who should be trained
 - Evaluate the feasibility of developing regional plans to address the availability of water treatment chemicals and supplies, fuel and power in the event of an emergency
- Support sub-regional and regional backups and water system interconnections. In addition to general support for interconnections and backup systems in the region, the Council has the following recommendation for consideration by the legislature:

RECOMMENDATION #2: The Metropolitan Council recommends the legislature approve funding for the Minneapolis and St. Paul water system interconnection

- Support source water protection efforts and impaired waters initiative. The Council will work to increase awareness of the connection between efforts to improve surface water quality and drinking water supplies. In addition, the Council will determine the need for updating of spill response efforts and training.

6. INSTITUTIONAL ARRANGEMENTS AND FUNDING

Minnesota Statutes, section 473.1565 requires the Metropolitan Council (Council) to make recommendations for the ongoing and long-term funding of metropolitan area water supply planning activities and capital investments. The stakeholder workshops supported the need for funding in these areas. Furthermore, there is national precedent to share regional planning costs based on water usage, population and tax bases. Many metropolitan areas around the country, notably Seattle, San Antonio, New York City and other, currently share the costs of regional water supply planning. Such cost-sharing is often based on water usage, water system capacity, population and tax base. There is also precedent to allocate a portion of such planning costs to new development. For instance, many communities commonly include water system planning costs in Water Access Charges (WAC) or area charges. During Phase II, the Council will continue to evaluate potential funding sources and will likely make recommendations in subsequent years.

In order to ensure supplies are developed in a reliable, cost-effective manner there may be a need to explore a variety of governance models. This section briefly describes the existing governance structures and funding in the region.

6.1. Existing Governance

Governance of drinking water in the metropolitan area takes on several forms. Of the 121 communities in the metropolitan area 98 (81%) are self supplied. The remaining 23 (19%) communities purchase water either wholesale or retail from the Minneapolis Water Works, which provides all of the water used by the Joint Water Commission (Crystal, Golden Valley and New Hope) and the cities of Columbia Heights and Hilltop on a wholesale basis. Minneapolis Water Works also supplies water to the Morningside community in Edina and up to 30 million gallons per day (MGD) to the Bloomington. In addition to serving these communities, Minneapolis Water Works supplies Minneapolis-St. Paul International Airport and Fort Snelling. The total population served (2004) by municipal systems that relied directly on the Minneapolis Water Works is estimated to be 551,000. The St. Paul Regional Water Services (SPRWS) supplies water on a wholesale basis to Arden Hills, Little Canada and Roseville. These communities handle distribution and billing of the water delivered by SPRWS. Several other cities are retail customers of SPRWS, meaning that SPRWS does all of the distribution and billing for the cities. Retail customers include Falcon Heights, Lauderdale, Maplewood, Mendota, Mendota Heights, and West St. Paul. St. Paul also serves the Minnesota State Fair Grounds. The total population served by municipal systems that relied directly on the St. Paul Regional Water Service in 2002 is estimated to be 406,000.

Pairs or small groups of cities have formed interconnections, mutual aid agreements and/or other forms of cooperative relationships to achieve specific purposes. A few local examples include the Southwest Metropolitan Ground Water Work Group, River Defense Network and Upper Mississippi River Source Water Protection Group. There is tremendous variety in these, relatively, informal arrangements in terms of the problems they solve, the extent of cooperation they entail and the activities covered. An example of a more formal sub-regional organization is the Joint Water Commission. The Joint Water Commission is a joint powers organization for the cities of Crystal, Golden Valley and New Hope. The commission comprises of one manager member appointed by each member city council. The commission has the authority to own, build and contract for facilities.

It also allocates costs to the members based on a pro-rated cost share formula for water consumption. The commission has a contract to purchase water wholesale from the City of Minneapolis.

6.2. Current Funding Mechanisms

The vast majority of metropolitan area drinking water projects are financed through tax-exempt, long-term municipal bonds. Each year a few projects are financed, all or in part, through loans available through the State Drinking Water Revolving Loan Fund. For some projects, usually of smaller size, sponsors may fund all or a portion of the capital cost with cash reserves.

Municipal Tax-Exempt Bond Financing

Enabled and regulated through various Minnesota state statutes, counties, statutory cities, and home rule charter cities in Minnesota have the ability to finance drinking water projects through tax-exempt bond financing. Such financing may be backed by the full faith and credit of a municipality, specific water utility revenues, or both. The interest cost of such financing varies depending on a sponsor's tax base, type of pledged revenue, amount of previously issued debt, and economic prospects. Generally, such financing is arranged over 20 – 40 years at interest rates ranging from 3 – 6 percent. Bonds are repaid through revenues generated by the water utility, taxes, or a combination of both.

State Drinking Water Revolving Loan Fund

The Minnesota Department of Employment and Economic Development, through its Public Facilities Authority (PFA), administers a drinking water loan program as authorized by Minnesota Statutes 446A.081. The purpose of the program is to enable borrowers to finance public drinking water storage, treatment, and distribution infrastructure that meet Safe Drinking Water Act standards. Funding is enabled through below-market, long-term loans structured as part of a state revolving loan fund. Projects are reviewed and prioritized by the Minnesota Department of Health (MDH) before being considered for a loan. Project sponsors must issue a general obligation bond to the PFA as security for the loan.

In 2005, the program provided loans to 16 projects throughout the state totaling \$39.0 million. That year, the PFA received \$16.4 million in federal funds combined with a state match of \$6.8 million which, when combined with loan payments and PFA bond proceeds, were made available for 2006 loans. Twenty projects totaling \$38.98 million were funded in 2006. It is projected that 28 projects totaling \$38.5 million will be funded in 2007.

Water projects benefiting multiple communities or offering other regional benefits are eligible for funding under the program. In those cases, a lead city, joint powers agency, special district, or other institution must have general obligation taxing authority in order to qualify for a loan. Generally, cost-sharing arrangements are left to the project sponsors to work out, however such arrangements should be reasonable. Due to the limited amount of program money available and the need to make such money available to its many applicants statewide, it is likely that program financing will continue to offer only limited benefits to the metropolitan region.

User Charges, Taxes and Developer Exactions

Drinking water project operating expenses and loan payments are generally paid from three sources: user charges, taxes, and fees charged to new development. Such financing is common-place in the metropolitan area, with user charge revenue being the dominant source of funding. Developer exactions charged to development sites or new connections commonly include area charges, expressed on a per acre basis, and water access charges (WAC) based on potential water demand. The ability of municipalities to set user charges sufficient to recover the cost of providing water service is a key factor in supporting water utility operations and debt repayment. Water projects benefiting multiple communities or offering other regional benefits also use these funding sources to finance projects and pay operating expenses. In those cases, loan payments are often allocated among project beneficiaries on a cost of service basis usually related to respective water demands or other measure of project use.

Special Assessments

Minnesota State Statutes sections 116 and 429 provide for the establishment of special assessments on parcels of land benefiting from a drinking water project undertaken by a county, statutory city, or home rule charter city. Such assessments are determined by allocating water project costs among benefiting parcels commensurate with the benefit received. Such benefits are often defined by expected water demands. Assessments may be paid upfront or amortized over up to 40 years as specified by the issuer. Often, such assessments are structured to coincide with annual bond or loan payments.

Homeland Security Grants

Grant funding for water system security projects is available through the U.S. Homeland Security Department. Minnesota has been allocated \$13.4 million in such funds in 2006. Grants available through Urban Area Security Initiative Allocation total \$4.31 million for the twin cities area, and grants available through the Law Enforcement Terrorism Prevention Program total \$3.49 million.

6.3. Summary and Next Steps

Currently, there are over 100 separate water supply utilities within the metropolitan area. Regional approaches to water supply issues within the metropolitan area will require a cooperative effort of local jurisdictions and the Council.

Beyond funding for the 2006-2008 planning effort, there is currently no funding available to support on-going regional water supply planning in the metropolitan area. Participants of the Council led workshops commented that a lack of such funding could delay or eliminate some of the longer-term planning activities that would support management of water resources. Beyond updates to the current regional water supply plan, a lack of ongoing funding would defer or eliminate data collection and analysis efforts that might mitigate potential future water supply limitations.

In addition, workshop participants commented on the need to improve access to capital financing. Due to limited funding, priority is given to those projects meeting basic water supply needs (e.g. replacing a contaminated supply). In the metropolitan area, water supply projects benefiting multiple

communities will often entail emergency interconnections, development of backup water sources, or developing water supplies to support future growth and development. Existing state funding sources will likely be insufficient to meet these needs.

In response to these concerns, the Council will focus its efforts in the following areas during Phase II:

- Work closely with local jurisdictions and the Advisory Committee to explore and identify governance mechanisms to implement needed improvements and programs
- Develop options for ongoing and long-term funding for metropolitan area water supply planning activities and capital improvements

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7. SUMMARY NEXT STEPS AND RECOMMENDATIONS

7.1. Summary

Although the region is fortunate to have an abundance of water, local resource issues and complaints about the regulatory process occur regularly. These issues and complaints resulted in the 2005 Minnesota Legislature directing the Council to “carry out planning activities addressing the water supply needs of the metropolitan area.” Specifically, the Council is to develop a base of technical information for water supply planning decisions and to prepare a water supply master plan for the metropolitan area. The legislature also established a Water Supply Advisory Committee to assist the Council in its planning activities, and it directed the Council to submit regular reports to the legislature detailing progress. The first report is due by the date the legislature convenes in 2007, and subsequent reports are due every five years thereafter. This document satisfies the requirement of Minnesota Statutes, Section 473.1565, Subdivision 3 as the first report to the legislature.

During Phase I of implementing the legislature’s directive, the Council collected information and conducted analysis on water supply systems, water demand projections and resource limitations, water resource monitoring. In addition, the Council evaluated the current regulatory process, agency roles and safety and security issues in the region. Throughout Phase I it was made clear that it is important to evaluate water availability in the context of projected growth to ensure a sustainable and reliable supply throughout region.

7.2. Next Steps

The issues raised during Phase I will be further evaluated in Phase II and ultimately will be addressed in the master plan. Phase II will address:

Water Demand and Availability

- Facilitate collection, sharing and analysis of regional data
- Improve understanding of water supply sustainability

Regulatory Process

- Develop alternatives for areas where resource limitations are identified
- Formalize current Council/DNR community water supply planning review process
- Support the DNR’s efforts in streamlining water emergency and conservation plans and implementing the 10-year permit
- Develop a water conservation toolbox to help communities implement best management practices, improve water use efficiencies and meet requirements of the 10-year permit
- Work with the DNR and MDH to develop a single application system for multi-agency water supply system/water appropriation approvals

Safety and Security

- Evaluate and support state/regional activities that improve security and reliability of local water systems
- Support source water protection efforts and impaired waters initiative
- Support sub-regional and regional backups and interconnections

Institutional Arrangements and Funding

- Work closely with local jurisdictions and the Advisory Committee to explore and identify governance mechanisms to implement needed improvements and programs
- Develop options for ongoing and long-term funding for metropolitan area water supply planning activities and capital improvements

7.3. Recommendations

In addition to the ongoing activities outlined above, the Council has the following recommendations for consideration by the legislature:

RECOMMENDATION #1 - Approve statutory changes clarifying agency roles in water supply plan review and consolidating into one statute the requirements of community water supply plans in the metropolitan area and link water supply planning to comprehensive planning

RECOMMENDATION #2 - Approve funding for the Minneapolis and St. Paul water system interconnection