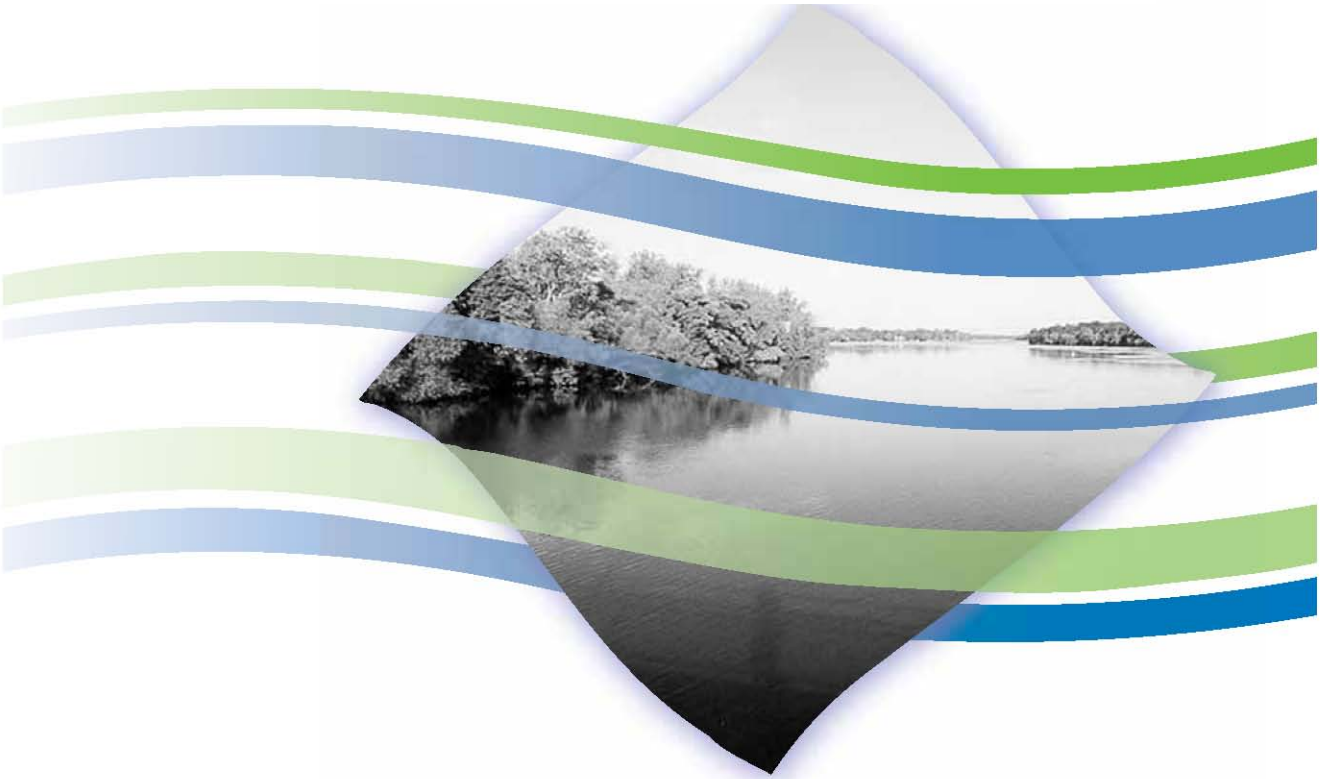
Metropolitan Council
Environmental Services

Demand Charge Task Force

Final Report

September 2010



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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 guide the efficient growth of the metropolitan ara. The Council operates wastewater and transit services and administers housing and other grant programs.

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Executive Summary

The Metropolitan Council's *2030 Water Resources Management Policy Plan* calls for the Council to implement a wastewater demand charge in 2013 for communities that have excessive inflow/infiltration. The intent of the demand charge would be to defray the cost of providing attenuation (storage) of excessive I/I to avoid overloading downstream facilities. In August 2009, the Council established a Demand Charge Task Force to develop specific recommendations for the demand charge. The Task Force met from September 2009 to August 2010, generally on a bi-monthly basis.

Since the beginning of the Council's infiltration/inflow program in January 2007, 46 communities have participated in the program. A total of $46 million of local infiltration/inflow mitigation work has been documented through 2009. The recent drought in the region has made assessing the overall effectiveness of the program difficult. However, the decline in influent flow at the region's wastewater treatment plants measured since 2002 is at least partly the result of this investment in infiltration/inflow mitigation.

2009 – 2010 Demand Charge Task Force

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With a desire to continue the infiltration/inflow program's progress and with the understanding that investing in local mitigation rather than storage is the region's preferred approach to reducing infiltration/inflow, the Demand Charge Task Force recommends:

- The Council implement an ongoing infiltration/inflow reduction program similar to but improved from the existing program rather than a demand charge in 2013.
- In cases where a community is not meeting its infiltration/inflow goal(s) or the community has not been implementing an effective I/I reduction program in the determination of the Council or if regulations and/or regulatory permits require the Council to ensure regulatory compliance, the Council may institute a wastewater rate demand charge.
- The Council amend the *2030 Water Resources Management Policy Plan* to reflect these recommendations.

Introduction

The Metropolitan Council's inflow/infiltration (I/I) policy contained in the *2030 Water Resources Management Policy Plan* (2030 Policy Plan), adopted in 2005, established that the Council will not provide additional capacity to serve excessive I/I entering the regional sanitary sewer system. Further, starting in 2013 the Council is to implement a wastewater demand charge for communities that continue to require service for excessive I/I. The demand charge would defray the cost of providing attenuation (storage) of excessive I/I to avoid overloading downstream facilities. In August 2009 the Council appointed a Demand Charge Task Force to develop recommendations for the demand charge including its specific features and the 2013 implementation date.

While the local mitigation of I/I has been successful in eliminating some of the excessive I/I, some remains in the system and it is expected to be a long-term challenge to achieving the Council's guidelines for allowable I/I. Without additional mitigation, the Council and its ratepayers will face substantial capital expenses for infrastructure to convey and treat the excessive I/I and risk of overflows will continue.

Council's Existing I/I Policy and Program

Concern about the impacts of I/I on the regional sanitary sewer system led the Council to appoint an I/I task force that met in 2003/2004 to develop recommendations for an I/I reduction program. The I/I Task Force estimated that the cost to store, convey, and treat excess I/I was in the $900 million range while the cost for source removal was in the $150 million range. Risk of system backups and overflows would continue. The I/I Task Force recommended that the Council initiate an I/I program focused on mitigating excess I/I versus increasing system capacity. The Council's existing I/I reduction program, based on the Task Force's recommendation and adopted in the Policy Plan, is a surcharge approach to source removal.

The Policy Plan states that the Council will not provide additional sanitary sewer system capacity to serve excessive I/I. Communities with excessive I/I would be required to eliminate the excess I/I within a reasonable time period. The premise of the policy is that short-term peak wet weather flow uses the system's reserve capacity needed for growth. The program's implementation strategies are shown on the right.

I/I Program Implementation Strategies

- I/I goals for all communities based on the designed peak hour flow capacity of the interceptor(s) serving the community and using the current peak hourly flow factor design standards for interceptors
- Community I/I mitigation programs developed and implemented from 2007 to 2011
- I/I surcharge program initiated by Council in conjunction with communities
- In 2013, for communities not meeting I/I goals (a) limit future increases in wastewater service until goal(s) are met and (b) institute a wastewater rate demand charge.

The I/I surcharge program began January 1, 2007. To date, 46 communities have participated in the surcharge program. A total of $46 million of local I/I mitigation work has been documented through 2009 as part of the program. The region's recent drought has made assessing the overall effectiveness of the program difficult. However, the decline in influent flow at the region's wastewater treatment plants measured since 2002 is at least partly the result of this investment in infiltration/inflow mitigation.

Demand Charge Task Force

On August 13, 2009 the Council appointed a Demand Charge Task Force to develop recommendations for the demand charge including its specific features and the 2013 implementation date. The Task Force generally met bi-monthly from September 2009 to August 2010. The Task Force reviewed information presented by the Metropolitan Council Environmental Services (MCES) staff, which also provided facilitation and administrative support. The recommendations and conclusions were arrived at by consensus of the Task Force members.

The Task Force established goals for the next phase of the Council's I/I program. The Task Force recognized that several goals conflict and that satisfying all goals was likely not possible. Given that I/I mitigation is a complex issue with numerous aspects that communities and the Council cannot control or foresee the Task Force sought a balanced approach that would foster continued progress as it developed recommendations for the next phase of the program.

Goals for I/I Program's Next Phase
• **Effective** in achieving I/I policy goals • **Equitable** among served communities • **Defensible** using measured flow data • **Fiscally responsible** consistent with cost of service and other policies; accounts for regional economics • **Reasonable, uniform** rules and procedures • **Flexible** to deal with uncertainties and change • **Understandable**

System Capacity Analysis

I/I mitigation is needed in order to recover or maintain regional sanitary sewer system capacity to provide for growth and to help minimize the potential for wastewater backups in basements, spills from manholes, or overflows from regulators. The 2013 demand charge implementation date was established based on a 2004 analysis of the sanitary sewer system performed for the previous I/I task force. A new capacity analysis was performed using more recent data and projections. See Appendix A for full details of the capacity analysis. Conclusions from the analysis are summarized in the box on the following page. The current system analysis indicates that capacity is adequate for several years longer than the previous analysis indicated. With the slowdown in regional growth, the current policy's 2013 demand charge implementation date appears less urgent.

System Capacity Analysis
Interceptor Capacity • A small number of growth-related interceptor capacity improvements are needed and are underway. • Capacity is adequate through 2020 for the remainder of the interceptor system. • If not addressed, excessive I/I will continue to cause interceptor system capacity constraints and risks. *Treatment Capacity* • Excessive I/I uses reserve capacity at the Blue Lake, Metropolitan, and St. Croix Valley Wastewater Treatment Plants (WWTPs). • During extremely excessive I/I events, flow has been diverted around the biological treatment system to protect the process. Though effluent limits have been met under these conditions, this flow blending poses future regulatory risk. • No WWTP capacity expansions are planned in the immediate future.

I/I Program Issues and Recommendations

During the course of Task Force meetings, members' comments ranged from the I/I program's nature and goals to specific aspects of program implementation. The following paragraphs summarize members' comments about the overall program. Table 1 summarizes a number of specific implementation issues and recommendations for the next phase of the I/I reduction program.

Members' comments about the overall program fell into the following categories:

- Program's goal and approach
- Program procedures
- Appeals

Task force members agree with the Council's policy and the I/I program's premise of eliminating excess I/I sources rather than increasing regional sanitary sewer system capacity to handle excess I/I. Members commented that drought, water conservation and I/I mitigation itself can unfairly make a community's goals more difficult to reach under the current program's goal-setting method. Members also discussed how the program would ultimately measure success. Sources of excess I/I may become more difficult to locate and mitigate, I/I mitigation is not well-defined, and the vagaries of weather, such as drought, can complicate measuring the program's effectiveness. Currently, a community satisfies program requirements by expending funds on local mitigation equal to its surcharge. While this may satisfy program requirements, there is no guarantee it achieves the program goal of reducing excess I/I and avoiding future exceedances.

Table 1 I/I Program Issues and Recommendations		
Issue	**Description**	**Recommendations**
Program Goal and Approach		
Goal	The goal of the I/I program is to minimize the risk of system backups and overflows and to reserve system capacity for growth.	Continue the I/I program with these two goals, with added recognition of case-by-case evaluations of risk based on system capacity analyses and applicable regulatory requirements.
Demand charge	A demand charge approach to I/I mitigation, in which a community with excessive inflow/infiltration would be assessed a charge to defray the cost of the Council's providing attenuation (storage) of excessive I/I, diverts funds from local mitigation and allocates them to building storage. This approach does not address I/I at the source and it has not been shown elsewhere to effectively avoid backups, spills, and overflows. It is not the preferred approach to reducing infiltration/inflow.	• Implement an ongoing I/I reduction program with characteristics similar to the existing program (i.e., continuing to "rebate" mitigation costs), rather than imposing a general demand charge, beginning in 2013. • In any specific case in which a community is not meeting its infiltration/inflow goal(s), and the community has not been implementing an effective I/I reduction program in the determination of the Council or if regulations and/or regulatory permits require the Council to ensure regulatory compliance, the Council may institute a wastewater rate demand charge.
Allowable I/I	The current program establishes I/I goals for each metershed by setting an allowable peak hour flow, based on average flow multiplied by the applicable MCES standard peaking factor. The standard peaking factors account for diurnal flow variation and an allowable level of I/I. Although based on industry standards, the factors do not directly address the following: • Specific amount of allowable I/I incorporated in the factor. • Type of sewer system (sanitary versus originally combined). • Age of sewer system (design codes that allowed sump pump and foundation drain connections; materials of construction). • Antecedent precipitation and subsequent groundwater level. • Rainfall intensity, duration, volume, and frequency are not considered, due to regulatory compliance issues. Consequently, two problems arise:	• Continue to determine exceedances based on peak hour flow using its standard peaking factors to determine peak hour flow limits. • Gather, analyze, and share the program's existing information and data to better quantify mitigation effectiveness • Evaluate and develop, as appropriate, an improved method for determining allowable I/I that better accounts for items such as: o Age and type of sewer system o Risk of overflow and backups o Historical flow variability and components (base sanitary flow, groundwater infiltration, rainfall-dependent I/I) o System hydraulics, such as available flow attenuation, travel time, and reserve capacity • Use the findings of the above to update the program for

Table 1 I/I Program Issues and Recommendations		
Issue	**Description**	**Recommendations**
	(1) It is difficult to assess the effectiveness of I/I mitigation work. (2) Communities may cycle on and off the I/I exceedance list, even after expending significant funds on I/I mitigation.	the 2040 Policy Plan.
Program Procedures		
Base flow	The current program uses a 3-year rolling average daily flow as the base flow for determining allowable peak flows. Drought can lower a community's 3-year rolling average which, in turn, lowers the community's allowable peak flow.	Use a longer time period (e.g., 10 years) for the base flow to normalize the effects of precipitation (drought and wet periods).
Water conservation, and I/I mitigation	A community's water conservation and I/I mitigation can lower its 3-year rolling average daily flow. This, in turn, lowers the community's allowable peak flow, effectively penalizing a community for water conservation and I/I mitigation.	Provide a general adjustment of 1% per year for water conservation and I/I mitigation so as not to penalize communities for their work in these areas. Also, allow for a greater adjustment if a community can substantiate it with actual data.
Growth	If a longer time period is used for the base flow in the calculation of the allowable peak flows, communities that have had growth over the longer period will be penalized.	Adjust the rolling average daily flow for the wastewater generated by the growth in the community from the middle of the rolling average period to the goal year, thus increasing the base flow to account for the growth that has occurred.
I/I into Council interceptors	A community should not be accountable for I/I that enters the Council's interceptors that pass through the community.	Where applicable, adjust peak measured flows in a metershed by subtracting out that portion of the peak estimated to be due to I/I into Council interceptors in the metershed.
Metersheds	The lack of multiple meters in some larger communities makes it difficult to determine where I/I sources are and the effectiveness of specific I/I mitigation work. On the other hand, multiple meters can cause a community to have an exceedance when, if the flow was consolidated in one meter, no exceedance may have occurred.	• Continue to determine exceedances on a metershed basis. • Upon request and where substantial I/I exists, collaborate with communities in metering projects to assess I/I sources.
Mitigation period	The current program has a 5-year mitigation period (this is the length of the surcharge phase of the program).	Implement a 4-year mitigation period beginning with the exceedance's billing year (e.g., the mitigation period for a June 2013 exceedance would begin in January 2014; the mitigation period for a July 2013 exceedance would begin in January 2015). Reducing the mitigation period from 5 to 4 years

Table 1 I/I Program Issues and Recommendations		
Issue	**Description**	**Recommendations**
		reflects the fact that communities generally have had time to determine I/I sources and priority areas. In addition, allow a 1-year look-back period from the time of the exceedance; that is, I/I mitigation work performed in the calendar year prior to the exceedance would be eligible (e.g., mitigation expenses incurred in 2013 could help meet the requirements for the June 2013 exceedance; mitigation expenses incurred in 2014 could help meet the requirements of the July 2013 exceedance). The 1-year look-back period is intended to provide incentive for communities to perform ongoing and proactive I/I mitigation.
Appeals		
Locating I/I sources	What should be done if significant funds are expended in trying to locate specific I/I sources without success?	Allow a community to appeal to extend or defer the I/I mitigation period for a defined period of time until: • I/I sources are found (i.e., rain events occur that point to the sources) • The community can develop a reasonable mitigation plan in the absence of specific location information. The appeal must be based on the findings of the community's I/I source engineering investigation.
I/I mitigation cost assumption	The current program assumes I/I mitigation costs $350,000 (escalated each year for inflation) per million gallon per day of I/I reduced. While program cost documentation submitted by communities generally supports this value, there may be cases where a cost-benefit analysis is warranted.	• Continue the current program's procedure of allowing a community to appeal and reduce the estimated mitigation cost if the actual cost of mitigating the sources can be shown to be <u>less than</u> the estimated mitigation cost. • Allow a community to appeal the estimated mitigation cost if it is <u>more than</u> estimates of the lifecycle cost of storage, conveyance, and treatment of excess I/I. The appeal process would initiate a joint cost analysis between the community and the Council. The cost analysis would be based on appropriate design criteria such as a design storm frequency. If the cost analysis indicates that the estimated cost of mitigation is more than the estimated cost of regional storage, conveyance and treatment, the Council may allow the community to waive its option to

Table 1 I/I Program Issues and Recommendations		
Issue	**Description**	**Recommendations**
		perform the estimated mitigation work and the Council would impose a financial charge on the community to defray the cost of regional storage, conveyance and treatment.
Super Storm or other extraordinary circumstances	Should there be some limit on the size of storm event for which exceedances will be measured?	Although the Council's permits do not identify a storm frequency for which overflows or spills would be allowed, include an appeal process that may allow relief if a community is otherwise making progress toward I/I mitigation and a peak flow event was caused by unusual conditions or extraordinary circumstances.

Task force members commented on various technical aspects of the current program. They urged the Council to use the information and data gathered in the current program phase to further develop the program. For example, they questioned whether MCES' standard peaking factors are appropriate in all cases and whether the mitigation costs used to establish surcharge values are valid for all communities. They recommended that these and other technical aspects be reviewed.

Finally, task force members discussed program procedures. While members understood the need for the program to have uniform rules and procedures, they encouraged the Council not to take a "one-size-fits-all" approach in a program of this magnitude because such an approach could lead to inequities among communities. They suggested the Council consider ways to incorporate into the program processes such as case-by-case analyses, cost effectiveness reviews, and an appeal process for unique situations.

Though the Task Force and MCES staff could not address all of the issues raised, the Task Force members' comments provide areas to consider in the next 1 to 5 years as the Council further defines the I/I program and develops the 2040 Policy Plan.

After discussing a number of options for the next phase of the I/I program, the Task Force came to the consensus recommendation that the Council implement an ongoing, second phase (herein called "Ongoing Program") of the inflow and infiltration (I/I) reduction program beginning in 2013 rather than implement a demand charge at this time. The Task Force recognizes that the Council may need to institute a wastewater rate demand charge for those communities that have not met their I/I goal(s), if the community has not been implementing an effective I/I reduction program in the determination of the Council, or if regulations and/or regulatory permits require MCES action to ensure regulatory compliance.

A complete description of the recommended Ongoing Program is contained in Appendix B. The Ongoing Program requirements apply to all communities whether or not they previously were required to implement I/I reduction work. The Ongoing Program will be further defined in a Procedure Manual.

2030 Policy Plan Amendment

The Task Force recommends that the Council amend its 2030 Policy Plan as needed to reflect the changes to the I/I program. The text of the Policy Plan amendment is in Appendix C. A public hearing on the proposed amendment was held on July 13, 2010. Written comments on the amendment are contained in Appendix C also. This report addresses a number of the issues raised during the public hearing process, such as special regulatory circumstances, metering, MCES standard flow peaking factors, I/I mitigation costs, and time to complete I/I mitigation work. These issues will be addressed further in the Ongoing Program Procedures Manual and in the next Policy Plan update.

The recommended Ongoing Program is a result of the Council's I/I reduction initiative that began in 2003 with the initial I/I Task Force and was defined in the 2030 Policy Plan. Figure 1 shows the Ongoing Program schedule in relation to the Council's overall I/I Program and Policy Plan development, implementation, and evaluation. The Task Force recommends that a

Figure 1
I/I Program Schedule

Year	**'03-'04**	**'05**	**'06**	**'07**	**'08**	**'09**	**'10**	**'11**	**'12**	**'13**	**'14**	**'15**	**Beyond '15**
I/I Policy	I/I Task Force	2030 Policy Plan				Demand Charge Task Force 1					Demand Charge Task Force 2	2040 Policy Plan	
I/I Program													
a. Development			Surcharge Program Develop-ment				Ongoing Program Development						
b. Implementation				Surcharge Program (recommended extension of mitigation work to '12)						Ongoing I/I Reduction Program			
c. Evaluation								Surcharge Program Evaluation					

subsequent demand charge task force be convened in approximately 2014 to review and revise, as necessary, the Ongoing Program. The 2040 Policy Plan process will provide an opportunity to make any resulting policy revisions.

2011 and 2012 Surcharges

Recognizing the financial stresses associated with the current economic environment, the Task Force considered options to minimize the combined financial impacts of the Council's proposed SAC shift (discussed under the "Ongoing Program Cap" section of Appendix B) and any remaining I/I surcharge work. In the current surcharge phase of MCES' I/I program, I/I reduction work for non-capped communities is scheduled to be complete in 2011. An evaluation period, with no I/I reduction work except for capped communities, is planned for 2012. To lessen financial impacts and to allow I/I reduction activities to continue into 2012, the Task Force recommends that non-capped communities with I/I reduction work required in 2011 be allowed to defer up to half of the required work to 2012. Because capped communities are already deferring work beyond 2011, this recommendation does not apply to capped communities. However, the annual required I/I reduction work for capped communities in 2011 and 2012 will be determined based on 25% of the community's MWC minus the impact of any shift of costs from SAC to the municipal wastewater charge allowed by state statute MS 473.517 subd.3b.

Summary Recommendations

The Demand Charge Task Force recommends that:

- The Council implements the Ongoing I/I Reduction Program beginning in 2013.
- The Council may institute a wastewater rate demand charge for those communities that have not met their I/I goal(s), if the community has not been implementing an effective I/I reduction program in the determination of the Council, or if regulations and/or regulatory permits require MCES action to ensure regulatory compliance.
- Non-capped communities with I/I reduction work required in 2011 be allowed to defer up to half of the required work to 2012.
- The annual required I/I reduction work for capped communities in 2011 and 2012 be determined based on 25% of the community's MWC minus any SAC shift.
- The Council amends its 2030 Policy Plan as needed to reflect the above recommendations.

Appendix A
MCES Interceptor System Capacity Analysis

Metropolitan Council

Environmental Services –
Technical Services

DATE: November 2, 2009

TO: I/I Demand Charge Task Force

THRU: Bryce Pickart

FROM: Deborah Manning

SUBJECT: MCES Interceptor System Capacity Analysis

Purpose
This memo summarizes the results of an analysis of the MCES interceptor system in terms of capacity available for regional growth and the system impact of excessive infiltration/inflow. This analysis draws on previous system capacity analyses and will continue to be refined to respond to Demand Charge Task Force and other organizational needs.

Methodology
The methodology consisted of comparing projected flows for interceptors with interceptor capacity to determine if and when the interceptor capacity was exceeded. Average daily flows for communities were projected in 10-year intervals from 2010 to 2080. The average daily flows were distributed along interceptors serving each community to represent the point at which flows would enter the interceptor. Allowable peak flows, consisting of average daily flows and allowable infiltration/inflow (I/I), were calculated using MCES' standard peaking factors. Excessive peak flows, consisting of average daily flows with allowable and excessive I/I, were calculated using "observed" peak factors measured during actual rain events. Generally, the observed peak factors were the peak factors of record from the I/I surcharge program and most of these peaks occurred during the Oct. 4-5, 2005 storm. This storm had a 5 to 10-year return frequency. While the observed peaking factors do not reflect the impact of I/I reduction work performed in recent years by individual communities, a next step in the capacity analysis will be to assess existing data to determine if they show any trends. Three years of dry weather with no overflows and no overflows during recent low return frequency rain events preceded by drought conditions are good results. However, data from an extended period of normal to high precipitation is needed to truly assess overall effectiveness. Attachment 1 provides additional information about the methodology used for the analysis.

Metro Wastewater Treatment Plant Service Area

The figure "Metro Service Area – Expanded Capacity Needed by 2010 (without excess I/I)" shows in red those interceptors whose capacity will be exceeded by 2010 if there is no excessive I/I. The figure "Metro Service Area – Expanded Capacity Needed by 2010 (with excess I/I)" shows in red those interceptors whose capacity will be exceeded by 2010 if there is excessive I/I. Similar figures are provided for 2020. The following paragraphs discuss the results shown in these figures.

Expanded Capacity Needed by 2010 with and without Excess I/I

The 2010 without excess I/I figure shows that growth-related capacity improvements are needed for 1-GV-461 (Golden Valley), 1-MN-342 (southwest Minneapolis), and 1-RF-491 (Richfield). MCES currently has projects underway for these interceptors.

The 2010 with excess I/I figure shows that many capacity improvements are needed if I/I remains at observed levels.

- Risk of overflow occurs at the existing regulator on 1-MN-302 (on the east side of the Mississippi near the University). Recent reliability-related work on 1-MN-302 near the TCF Stadium, plus I/I reduction activities by St. Anthony and Minneapolis will reduce the risk of an overflow at the regulator on 1-MN-302 and also the regulator on 1-MN-300.
- Interceptor 8255, the Minneapolis East Interceptor (MEI), has a large capacity that provides in-line storage and protects against overflows at the regulators on 1-MN-340 and 1-MN-300.
- Risk of overflow at currently-observed peak flows also occurs at existing regulators on 1-MN-344, 1-MN-310, 1-MN-330, 1-MN-340, and 1-MN-341.
- On 1-MN-310 (northwest and downtown Minneapolis), MCES completed reliability improvements for the regulator at Portland and Washington. Minneapolis eliminated a storm sewer connection north of downtown which appears to be significantly reducing I/I.
- Flow monitoring by MCES and Minneapolis on 1-MN-341 (south Minneapolis) was aimed at assessing I/I reduction activities along this interceptor as well as providing information about average daily flows.
- Flow monitoring on other west of the river interceptors is ongoing or planned, though not necessarily for purposes of evaluating I/I reduction activity effectiveness.
- In the St. Paul tributary area, excessive I/I is an issue for 8660, 8566-370, 1-MS-100, 1-SP-230, and 1-SP-214 at currently-observed I/I levels. The City of St. Paul and MCES are coordinating temporary flow meters to better evaluate capacity and identify potential I/I source areas.

Expanded Capacity Needed by 2020 with and without Excess I/I

The 2020 without excess I/I figure shows that no new growth-related capacity improvements are needed beyond the 2010 improvements. The 2020 with excess I/I figure shows that additional capacity improvements for interceptors 1-GV-460 (Golden Valley) and 1-WO-501 (Oakdale) would be needed if I/I remains at currently-observed levels. MCES' rehabilitation of 1-GV-460 by installing cured-in-place pipe (CIPP) is aimed at reducing I/I in this interceptor as well as downstream in 1-MN-320.

Blue Lake Wastewater Treatment Plant Service Area

The figure "Blue Lake Service Area – Expanded Capacity Needed by 2010 (without excess I/I)" shows in red those facilities whose capacity will be exceeded by 2010 if there is no excessive I/I. The figure "Blue Lake Service Area – Expanded Capacity Needed by 2010 (with excess I/I)" shows in red those facilities whose capacity will be exceeded by 2010 if there is excessive I/I. Similar figures are provided for 2020. The following paragraphs discuss the results shown in these figures.

Expanded Capacity Needed by 2010 with and without Excess I/I

The 2010 without excess I/I figure shows that growth-related capacity improvements are needed for lift stations L22 and L23 (Victoria), L24 (St. Bonifacius), and L49 (Orono). MCES has projects underway to address these capacity needs.

The 2010 with excess I/I figure shows that, beyond the improvements needed for growth, capacity improvements for the following facilities are needed if I/I remains at observed levels: L63, 8352, and L60 in the Maple Plain/Orono/Long Lake area; L26 in the Wayzata area; 6-OR-641 and L59 in Orono; 6-MO-650 in Mound; L70 in Waconia, 7019-B, L22 and L23 in Victoria; L21 in Shorewood; and 7016 in Minnetonka.

Expanded Capacity Needed by 2020 with and without Excess I/I

The 2020 without excess I/I figure shows that the only new growth-related capacity improvement needed beyond the 2010 improvements is for 7019-B in Victoria. MCES is addressing this improvement as it addresses 2010-related capacity and reliability needs for lift stations in this area.

As shown in the 2020 with excess I/I figure, if I/I remains at currently-observed levels, numerous capacity improvements in addition to those needed by 2010 would be needed.

- Victoria area improvements (affecting 7019-B, L21, L22, and L23) will allow temporary, in-line storage of some excessive I/I from upstream communities in the immediate future. However, in the long-term, this capacity is needed for future growth.
- Wayzata Area Improvements (affecting L26, 7018-2, L46, L49, and 8567) will address system reliability and rehabilitation needs. However, no major system capacity expansion is needed or planned for this area.
- Planned improvements in the Mound and Excelsior areas (affecting 6-MO-650, L38 in Mound and L19, 7017, and several smaller lift stations and force mains in Excelsior) will also address system reliability and rehabilitation needs. However, no major system capacity expansion is needed or planned for this area.
- No near-term improvements are planned for the Chanhassen-Minnetonka-Eden Prairie area or the Prior Lake-Shakopee area. Gravity interceptor reserve capacity has generally handled excessive I/I, except for the 1987 super storm. However, continued excessive I/I from communities north of the Minnesota River will cause capacity exceedances in the Chanhassen-Minnetonka-Eden Prairie area by 2020.

Seneca Wastewater Treatment Plant Service Area

Growth-related capacity improvements are needed for 3-BN-499 (Bloomington). A construction project is underway to address this need. Excessive I/I does not cause capacity exceedances in this service area by 2020. Continued I/I control will ensure that capacity is available for growth.

Saint Croix Valley, Eagles Point, Empire, and Hastings Wastewater Treatment Plants Service Areas

Growth-related capacity improvements are not needed in these areas by 2020. Excessive I/I does not cause capacity exceedances in these service areas by 2020. Continued I/I control will ensure that capacity is available for growth.

Attachment 1
Methodology

The methodology used for the capacity analysis consisted of the following:

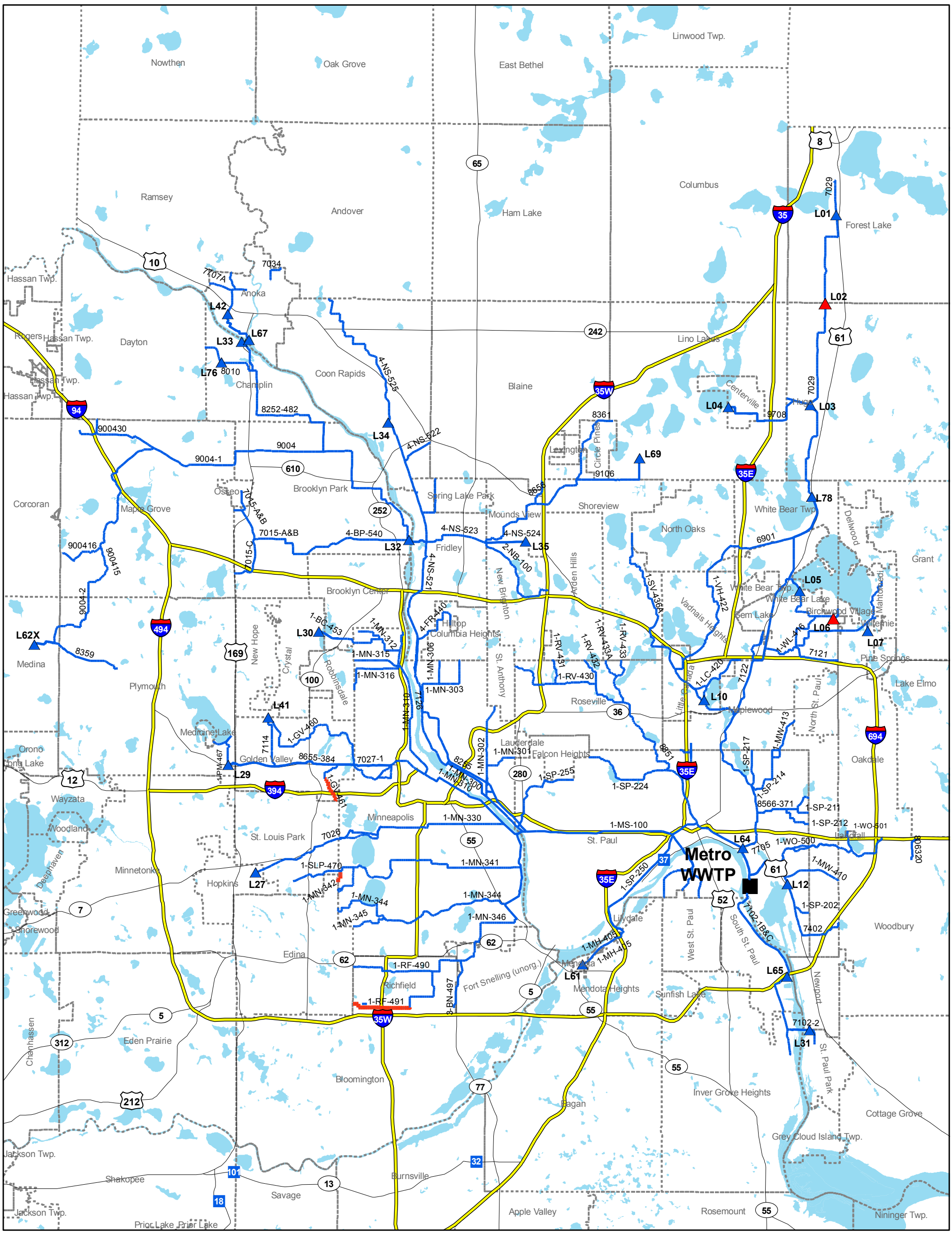
- Current average daily wastewater flows for each community were obtained from MCES billing and temporary meter data. These flows were allocated to each interceptor using a connection point database consisting of the location of local sanitary sewer connection points to each interceptor in the MCES system. Assumptions were made based on land use and wastewater generation rates in order to allocate flows along each interceptor.
- Current average daily flows were added cumulatively along each interceptor. To determine the allowable peak flow at any given point on an interceptor, the cumulative average daily flow was multiplied by MCES' standard peaking factor. To determine a peak flow reflecting excessive infiltration/inflow, the cumulative average daily flow was multiplied by an "observed peak factor." Observed peak factors were calculated from actual peak flows recorded in MCES' billing or temporary meter data.
- Future average daily wastewater flows for each community were projected using the community's historical wastewater flows (generally going back to 1989), MCES system statements, a community's planned land use information, Comp Plan Updates, etc. Future average daily wastewater flows were projected in 10-year intervals from 2010 to 2080.
- Future allowable peak flows and future excessive peak flows were calculated similarly to current flows.
- Interceptor system capacity was calculated using a hydraulic grade line analysis for gravity interceptors, assuming a 0.8 depth/diameter ratio (80% full). For force mains, the analysis assumed a maximum velocity of 7 feet per second. The analysis used firm capacity values in instances where redundant facilities are present. For example, in a lift station with 3 pumps, the analysis used the total capacity of 2 pumps rather than 3 pumps.
- The analysis used a static rather than dynamic approach to flow transmission, meaning no time of travel for flow was incorporated. Also, the analysis did not incorporate diurnal flow patterns (i.e., flow patterns that vary over the course of a day). The next phase of the capacity analysis will use a computer model to analyze both the dynamic and diurnal aspects of flow.

Metro Service Area

Interceptor Flow Greater than Capacity
Interceptor Flow Less than Capacity
Lift Station Flow Greater than Capacity
Lift Station Flow Less than Capacity

N

Expanded Capacity Needed by 2010 (without excess I/I)

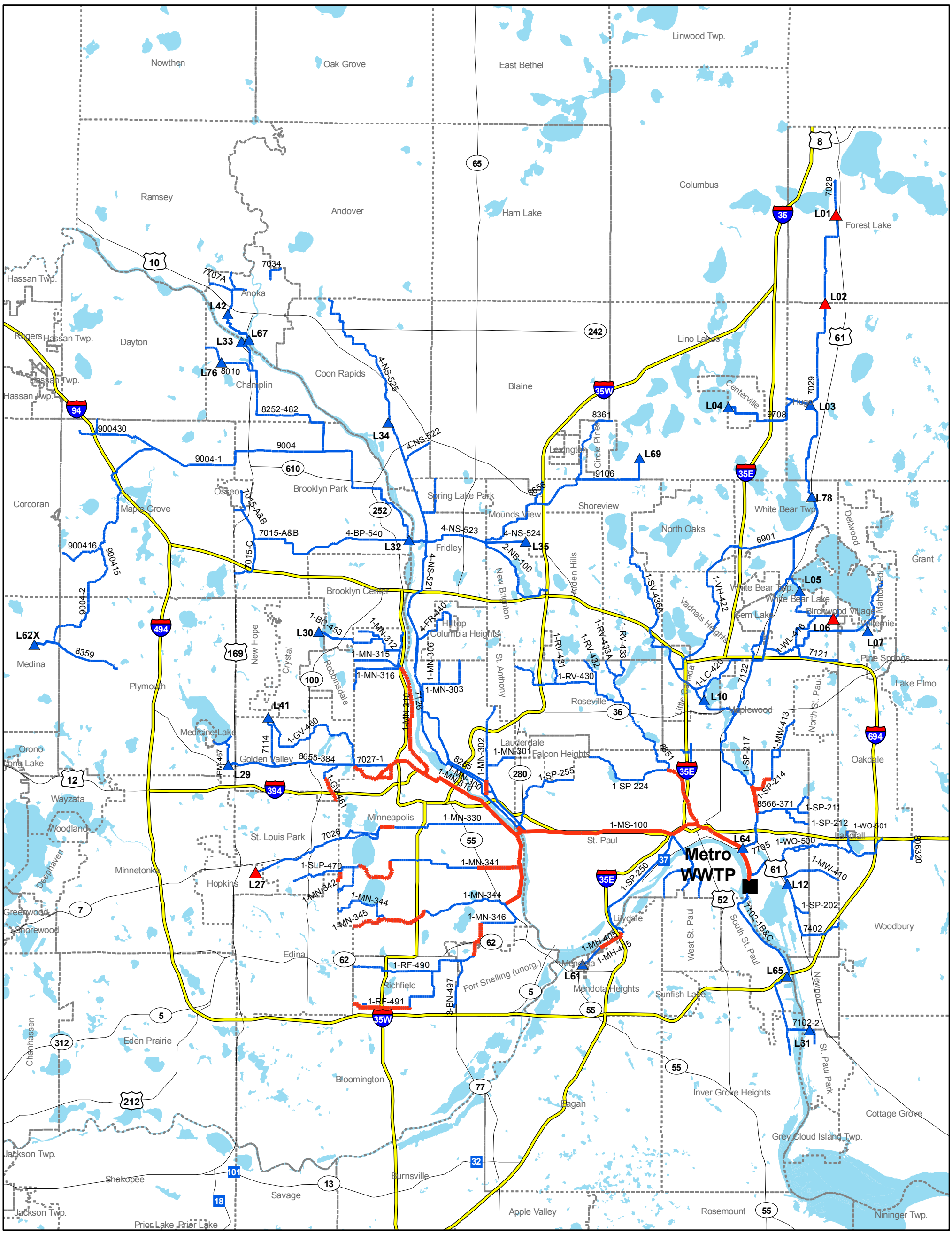


Metro Service Area

Expanded Capacity Needed by 2010 (with excess I/I)

Interceptor Flow Greater than Capacity
Interceptor Flow Less than Capacity
Lift Station Flow Greater than Capacity
Lift Station Flow Less than Capacity

N

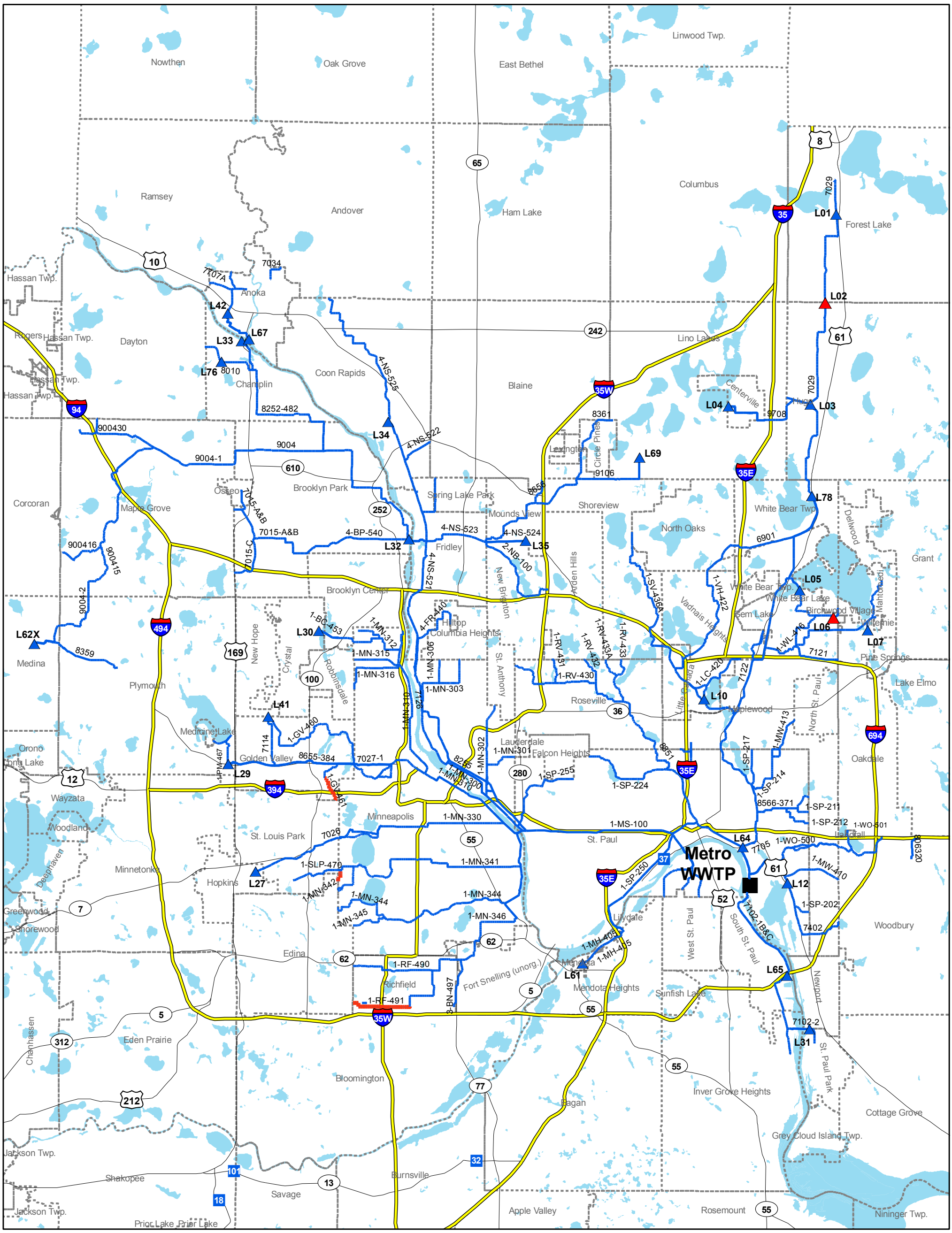


Metro Service Area

Interceptor Flow Greater than Capacity
Interceptor Flow Less than Capacity
Lift Station Flow Greater than Capacity
Lift Station Flow Less than Capacity

N

Expanded Capacity Needed by 2020 (without excess I/I)

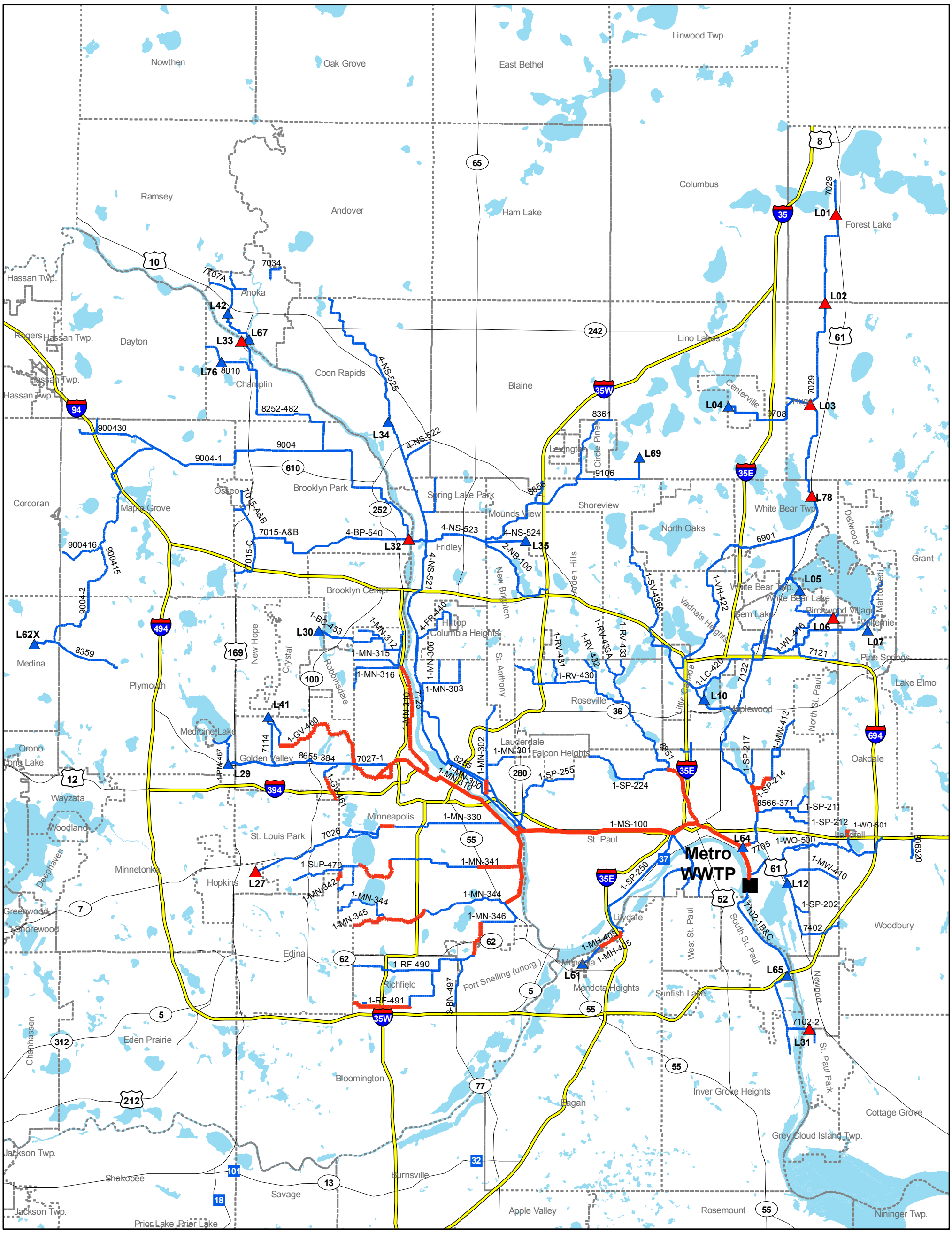


Metro Service Area

Interceptor Flow Greater than Capacity
Interceptor Flow Less than Capacity
Lift Station Flow Greater than Capacity
Lift Station Flow Less than Capacity

N

Expanded Capacity Needed by 2020 (with excess I/I)

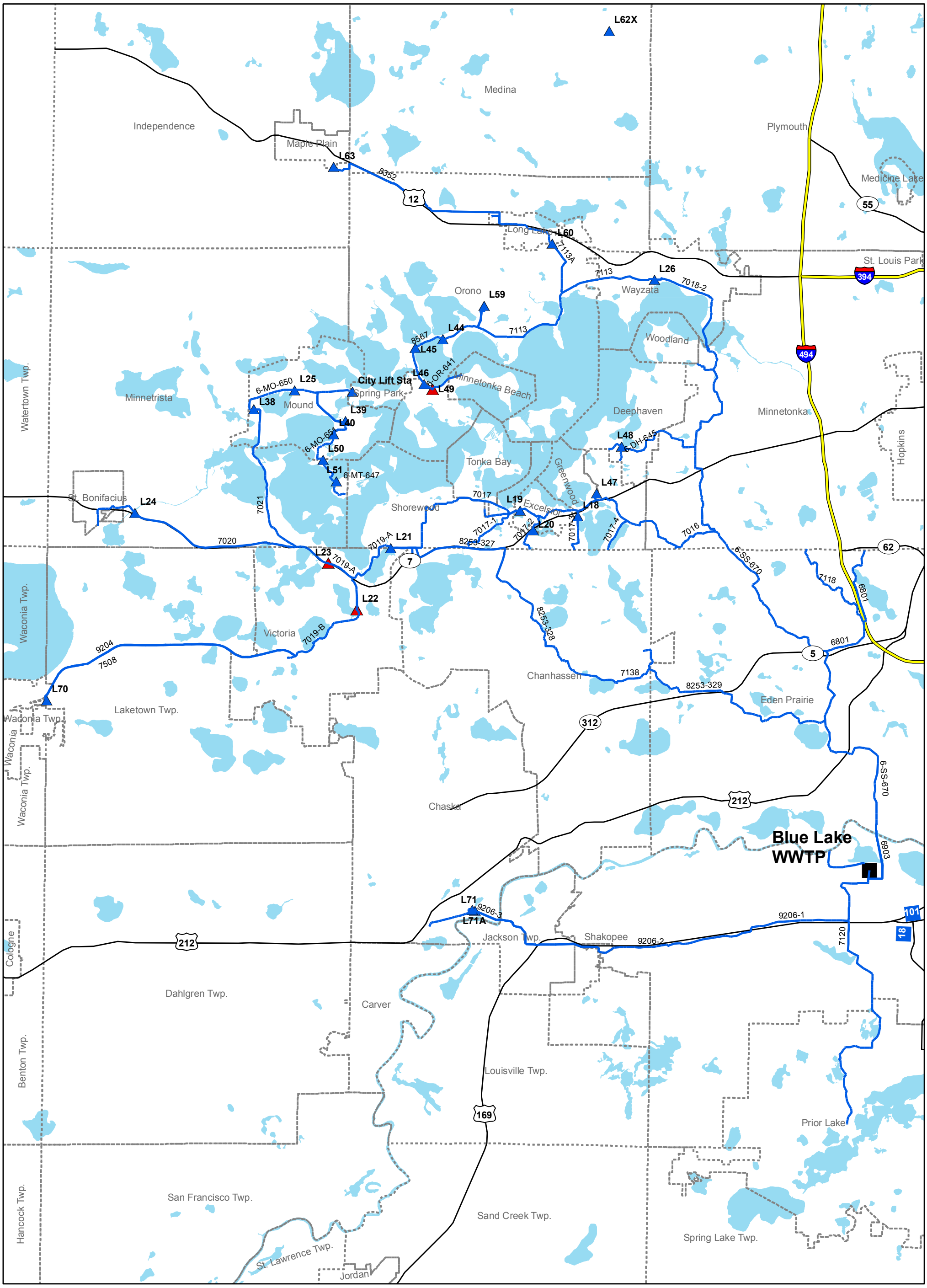


Blue Lake Service Area

Expanded Capacity Needed by 2010 (without excess I/I)

Interceptor Flow Greater than Capacity
Interceptor Flow Less than Capacity
Lift Station Flow Greater than Capacity
Lift Station Flow Less than Capacity

N

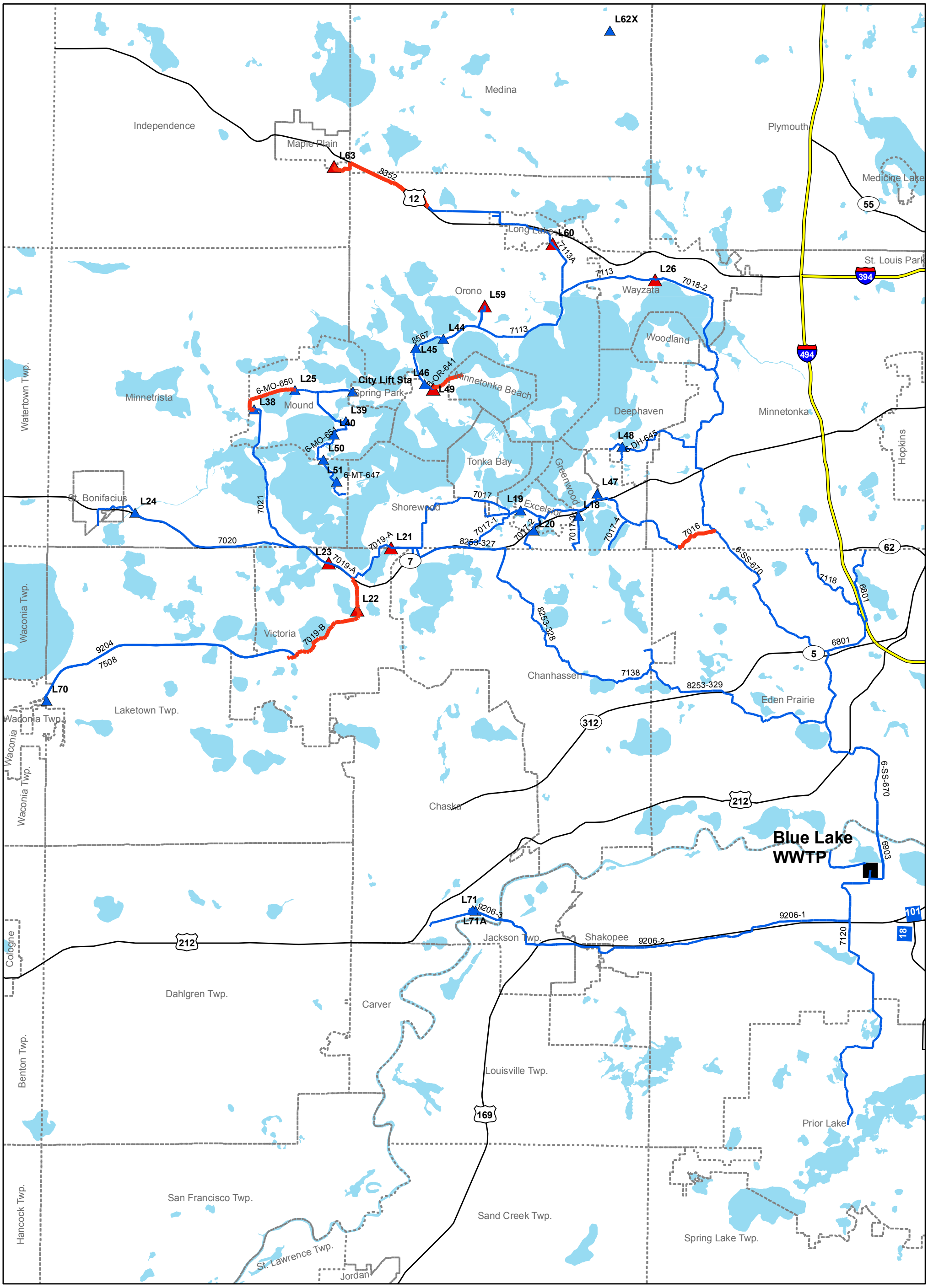


Blue Lake Service Area

Expanded Capacity Needed by 2010 (with excess I/I)

Interceptor Flow Greater than Capacity
Interceptor Flow Less than Capacity
Lift Station Flow Greater than Capacity
Lift Station Flow Less than Capacity

N

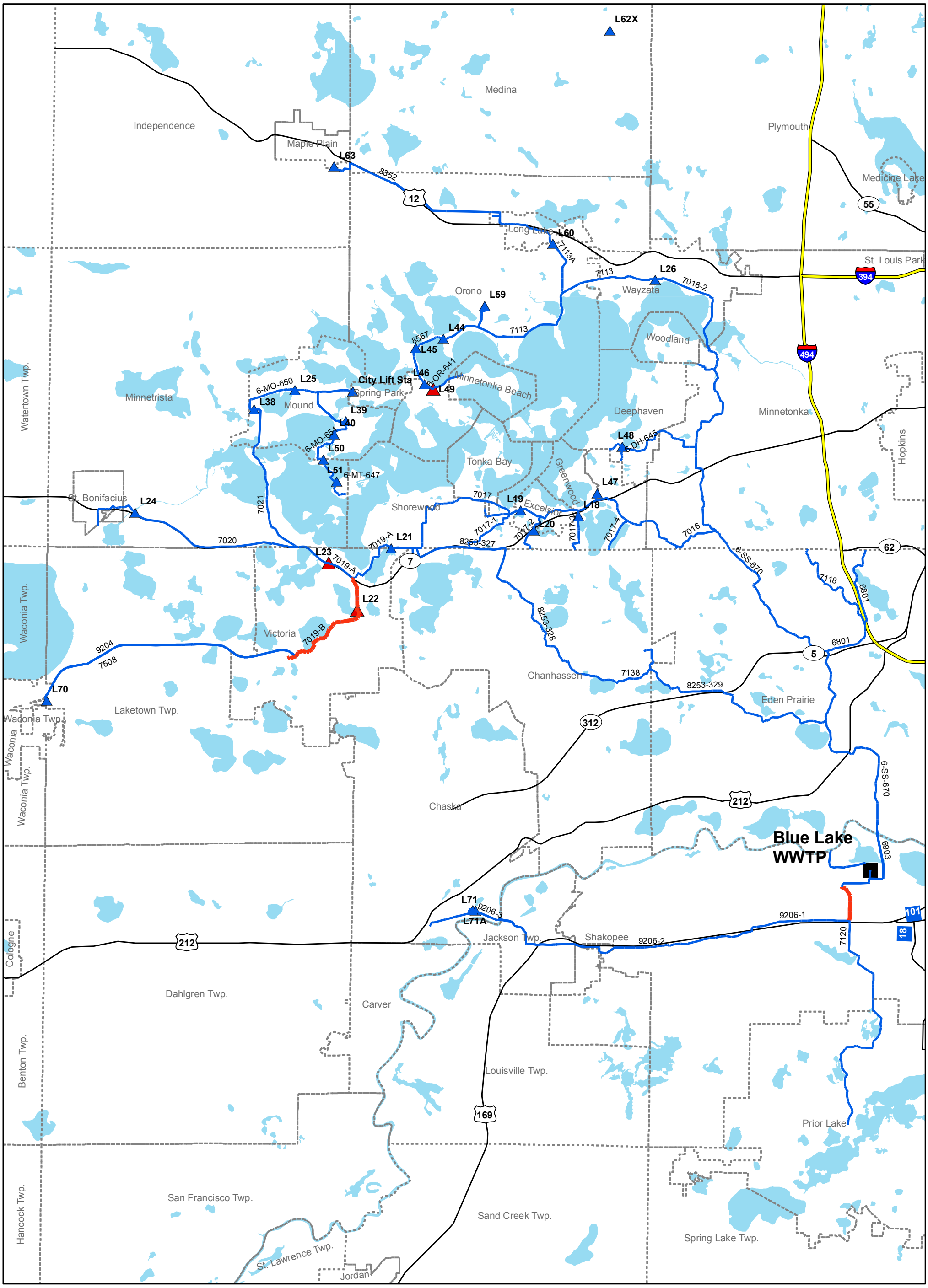


Blue Lake Service Area

Expanded Capacity Needed by 2020 (without excess I/I)

Interceptor Flow Greater than Capacity
Interceptor Flow Less than Capacity
Lift Station Flow Greater than Capacity
Lift Station Flow Less than Capacity

N

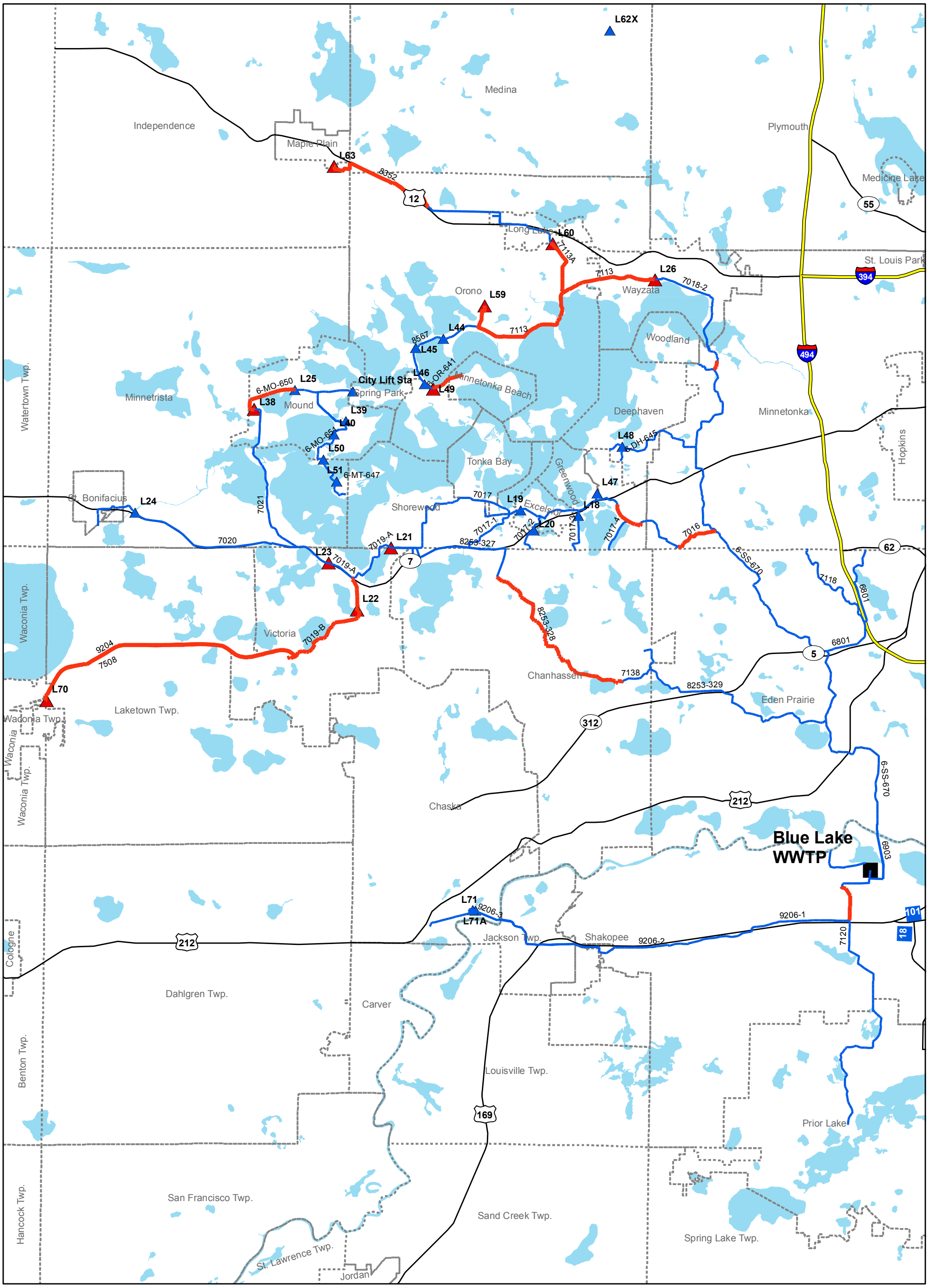


Blue Lake Service Area

Expanded Capacity Needed by 2020 (with excess I/I)

Interceptor Flow Greater than Capacity
Interceptor Flow Less than Capacity
Lift Station Flow Greater than Capacity
Lift Station Flow Less than Capacity

N



Appendix B
Ongoing I/I Reduction Program

Appendix B
Ongoing I/I Reduction Program

The following paragraphs summarize details of the Council's Ongoing I/I Reduction Program. The Ongoing Program will be further defined in a forthcoming Procedure Manual. The Ongoing Program requirements apply to all communities whether or not they previously were required to implement I/I reduction work.

I/I Reduction Goals

I/I reduction goals for communities will be set based on an allowable peak hour flow (PHF). These goals will continue to be set on a metershed basis. If a community has multiple metersheds, the community will have an allowable PHF for each metershed. Allowable peak hour flow will be determined as follows:

Allowable PHF = (10-year rolling average daily flow for metershed + adjustment for growth + allowance for water conservation and I/I mitigation) x (MCES standard peaking factor)

Specifically, the Task Force recommends the following:

- moving from the current 3-year rolling average daily flow basis to a 10-year rolling average daily flow basis in order to normalize the effects of precipitation variability (drought and wet periods)
- adjusting the 10-year rolling average daily flow for the wastewater generated by the growth in a community from the middle of the 10-year period to the current year
- continuing to use MCES' standard peaking factors
- providing an allowance for successful water conservation and local I/I mitigation (equal to 10% of the growth-adjusted, 10-year rolling average daily flow) so as not to penalize communities for successful water conservation and I/I reduction work
- reviewing the water conservation and I/I mitigation allowance when the impacts of water conservation efforts are better defined and when regional I/I mitigation effectiveness can be better assessed.

I/I into MCES Interceptors

The Task Force recommends that, where applicable, measured peak flows in a metershed be adjusted to reflect an estimated level of I/I into MCES interceptors. Because there are insufficient data to directly quantify I/I into MCES interceptors, several general approaches were evaluated for communities represented by the Task Force that have MCES interceptors in the community and for which GIS-based sanitary sewer information was readily available. The results described below are based on preliminary estimates. More detailed calculations will be performed in conjunction with affected communities prior to implementation of the Ongoing Program.

Direct Estimate. Current engineering design standards for new sanitary sewers allow for I/I in an amount equal to 100 gallons per day per inch-diameter-mile of sewer. Since MCES interceptors vary in age, peak I/I was estimated at 500 gallons per day per inch-diameter-mile of sewer to test this approach. The result is a reduction of peak hour flow by 1 to 4% where MCES has interceptors within a metershed.

Ratio of Sanitary Sewers. Another approach is to allocate excessive PHF using a ratio of local to regional sanitary sewers, which assumes that local and regional sanitary sewers have equivalent susceptibility to peak I/I. Using this approach, MCES' portion of community's exceedance PHF ranged from 2 to 30%.

Hybrid Approach. A third, hybrid approach was developed to bridge the differences between the previous approaches. In this hybrid approach, the first 30% of the exceedance PHF would be entirely the responsibility of the community; the responsibility for the remaining 70% would be split between the community and MCES on the ratio of inch-diameter-mile of community sanitary sewer versus MCES interceptor in the metershed. The community's required I/I reduction work would be estimated on the community-related I/I. See Table 1 for an example. Using this approach, MCES' portion of a community's exceedance PHF ranged from 2 to 20%. This appears to be a reasonable method to adjust measured peak flows for I/I into MCES interceptors and is recommended.

Table 1. I/I into MCES Interceptors using Hybrid Approach

Community sewers, in.dia-mi	MCES interceptor, in.dia-mi	Exceedance PHF, mgd	Community I/I, mgd	MCES interceptor I/I, mgd
4,000	400	5.00	[0.3 x 5.00 mgd] + [(0.7 x 5.00 mgd) x (4,000/4,400)] = 4.68 mgd	(0.7 x 5.00 mgd) x (400/4,400) = 0.32 mgd

I/I Reduction Work: Initiation, Estimated Amount, and Implementation Period

The estimated cost of required I/I reduction work will be determined by the amount of the exceedance PHF which is community I/I. The estimated I/I reduction cost is $350,000/mgd of community I/I exceedance, adjusted for inflation (base year is 2007). In the above example, if the exceedance occurred with a rate of $379,000/mgd, the estimated cost of I/I reduction work would be:

(4.77 mgd) x ($379,000/mgd) = $1,807,830.

In the Ongoing Program, each community will be allowed up to 4 years, after the flow metering period in which a peak flow exceedance occurs, to complete I/I reduction work equal to the total estimated cost to eliminate sources of excessive I/I. See below for eligible reduction activities.

Incremental Exceedances

If, during a 4-year I/I reduction implementation period, a community experiences another exceedance greater than the initial exceedance, the community will be required to complete an increased amount of I/I reduction work for the incremental exceedance. The community must complete the incremental I/I reduction work within a 4-year implementation period following the incremental exceedance. Upon completion of an incremental I/I reduction implementation period, the Ongoing Program flow metering period resets. If an additional exceedance occurs

after the 4-year implementation period expires, the new estimate of required I/I reduction work is determined on the full amount, not the incremental amount, of the exceedance.

I/I Reduction Work Eligibility

The Task Force also recommends that the Ongoing Program I/I reduction work eligibility requirements be revised as shown in Table 2. The public facility improvements shown in Table 2 eliminate some I/I from the sanitary system but also address other public facility goals. The I/I Reduction Program is aimed primarily at reducing peak inflow into the sanitary sewer. Thus, MCES will allow only the partial credit shown.

Capped Communities

For communities whose required I/I reduction work was previously capped, the Task Force recommends that they continue to implement their previous estimated I/I reduction work into the beginning years of the Ongoing Program. If a capped community has an exceedance that is above the previous maximum event between the time the Ongoing Program begins and its previous required I/I reduction work is implemented, the Ongoing Program requirements (i.e., Ongoing Program's new allowable PHF determination, adjustment for I/I into MCES interceptors, I/I reduction work eligibility, etc.) will apply to the incremental peak. The I/I reduction work associated with the new incremental peak must be completed within 4 years of the incremental exceedance. However, the community may request extension of this implementation period via an Ongoing Program Cap (see below). Once the previous phase and any incremental I/I reduction work is completed, the flow metering period resets. Required I/I reduction work on the next exceedance, if any, will be determined on the full amount of the exceedance.

Ongoing Program Cap

The Task Force recommends that an Ongoing Program cap be considered when a community's annual I/I reduction work required amount exceeds 25% of its annual adjusted municipal wastewater charge (MWC) from MCES. The adjusted MWC is the municipal wastewater charge from MCES to the community in the billing year adjusted to reflect a reduction for any amount of annual SAC transfer shifted to MWC due to current financial stress on SAC and permitted by the recently enacted SAC legislation (473.517 subd.3b). If a community is eligible and requests a deferral of its estimated I/I reduction work on this basis, its annual preliminary I/I reduction work amount would be recalculated to be capped at a 25% increase in annual wastewater charges from MCES. Note that this does not change the total estimated I/I reduction work required, but rather defers some of the work to later years. See Table 3 for an example calculation of the Ongoing Program cap.

Look-back Period

The Task Force recommends that a one-year look-back period be included in the Ongoing Program. MCES will consider a community's I/I reduction work performed in the calendar year preceding the exceedance's billing year as a credit to the estimated amount of I/I reduction work required because of the exceedance. See Table 4 for an example. The look-back period I/I reduction work is subject to the eligibility requirements described above. To receive feedback about whether I/I reduction work meets eligibility requirements, communities are encouraged to submit documentation annually.

Appeals
The Task Force recommends an appeal process similar to the previous phase of the I/I Reduction Program. The appeal process would recognize unusual or unique conditions that contributed to a peak flow event, such as construction that may have temporarily allowed storm water entry into the sanitary sewer or other extraordinary circumstances out of a community's control.

The Task Force also recommends that the Council allow a community to appeal to the Council the surcharge amount associated with an exceedance. The appeal would be based on a cost analysis, developed jointly by the community and MCES, of local mitigation of the exceedance amount vs. regional storage, conveyance and treatment of I/I (amount to be based on appropriate design conditions). If the appeal is approved, the Council may impose a demand charge on the community. Further details of the demand charge are to be determined.

Further, in cases where significant I/I source investigations have not successfully located I/I sources, the Task Force recommends that the Council allow a community to appeal to MCES' General Manager to extend or defer the I/I mitigation period for a defined period of time until:

- I/I sources are found (i.e., rain events occur that point to the sources)
- The community can develop a reasonable mitigation plan in the absence of specific location information.

The appeal must be based on the findings of the community's I/I source investigation.

References

Environmental Protection Agency (EPA). 2008. *Review of Sewer Design Criteria and RDII Prediction Methods.* Office of Research and Development, Washington, D.C. http://www.epa.gov/nrmrl/pubs/600r08010/600r08010.pdf

Metropolitan Council Environmental Services (MCES). 2004. *Inflow/Infiltration Task Force Report.* St. Paul, MN. http://www.metrocouncil.org/environment/ProjectTeams/documents/I-I-Report.pdf

Table 2. I/I Reduction Work Eligibility		
Type of Work	**Surcharge Phase**	**Ongoing Program**
1. I/I Study a. Temporary flow monitoring b. Field investigation for inflow sources c. CCTV inspection d. System modeling e. System analysis and work prioritization f. Cost estimating of reduction program	Yes; Full	Yes; full cost up to 20% of total estimated I/I reduction work eligible without pre-approval; costs above 20% require pre-approval
2. Public Facility Improvements a. Eliminate Strom sewer cross connections b. Eliminate yard drains and drain tile connections c. Replace maintenance hole (MH) covers that have drain holes with sealed covers d. Install watertight MH covers in areas vulnerable to high water levels e. Provide chimney seals and MH sealing f. Raise MH in areas where surface water ponds g. Move MHs out of wetlands; realign sewer h. Place drain tile behind curbs to provide a discharge point dedicated for building sumps, foundation drains, and rain leaders	Yes; Full	Yes; Full
3. Public Facility Improvements a. Pipe lining b. Line replacement c. Installation of new storm sewers that convey redirected flow from building sumps, foundation drains, and rain leaders in addition to other surface water d. Drainage improvements that eliminate indirect inflow sources	a. and b. Yes; 50% c. Yes; 10% d. Yes; 10%	a. and b. Yes; partial (50%); see note 1 below c. Yes; 50% d. Yes; 10% All costs a. thru d. must be pre-approved
4. Non-Municipal Improvements a. Inspection costs for looking for sump pumps, drain tile, yard drains and rain leaders connected to the sanitary sewer b. TV inspection of service laterals c. Disconnect sump pumps, drain tile, area drains, and rain leaders from the sanitary sewer system d. Repair or replace broken service laterals	Yes; Full at reasonable, actual costs or standard costs per note 2, below.	Yes; same as for Surcharge Phase
5. Public Staff Costs	Yes; Full for reasonable, verifiable, direct costs solely related to work. No administrative costs.	Yes; same as for Surcharge Phase.

1. Allowed if the work is identified in the communities' annual I/I reduction plan and data support the expenditures by clearly indicating a peak rainfall response (examples of data include CCTV inspection reports or temporary flow monitoring (ideally during storm events))
2. Standard costs: $150 per dwelling for sump pump disconnections; $3,000 per building for foundation drain disconnections; $100 per single family dwelling for rain leader disconnections; $3,000 per commercial dwelling for rain leader disconnections; $5,000 per repair for service lateral repairs)

Table 3. Calculation of Required I/I Reduction Work under Ongoing Program								
Conditions: Full exceedance in 2014; incremental exceedance in 2016; cap = 25%								
Measure-ment Period (period is mid-year to mid-year)	**Exceed-ance Event**	**Total I/I Reduction Work Required, $**	**Bill Year**	**Estimate of Annual I/I Reduction Work Required, $**	**Annual Municipal Wastewater Charge with Annual 3% Inflation*, $**	**Annual I/I Reduction Work Required, as Limited by Cap, $**	**Impact of Cap, $**	**Cumulative Deferral, $**
2011-2012			2013		1,190,000			
2012-2013			2014		1,230,000			
2013-2014			2015		1,270,000			
2014-2015	x	1,500,000	2016	375,000	1,310,000	327,500	(47,500)	47,500
2015-2016			2017	375,000	1,350,000	337,500	(37,500)	85,000
2016-2017	x	250,000	2018	437,500	1,390,000	347,500	(90,000)	175,000
2017-2018			2019	437,500	1,430,000	357,500	(80,000)	255,000
2018-2019			2020	62,500	1,470,000	317,500	255,000	0
2019-2020			2021	62,500	1,510,000	62,500	0	0
2020-2021			2022	0	1,560,000		0	0
2021-2022			2023	0	1,610,000		0	0
2022-2023			2024	0	1,660,000		0	0
2023-2024			2025	0	1,710,000		0	0
2024-2025			2026	0	1,760,000		0	0
2025-2026			2027	0	1,810,000		0	0
Total		**1,750,000**		**1,750,000**		**1,750,000**		
* Municipal Wastewater Charges will be adjusted to exclude any SAC shift adjustments.								

Table 4. Look-back Period Example		
Measurement Period during which Exceedance Event Occurs	**Exceedance Billing Year**	**Look-Back Period**
July 1, 2014 – June 30, 2015	Jan. 1, 2016 – Dec. 31, 2016	Exceedance date – Dec. 31, 2015 (if exceedance is in 2014) or Jan. 1, 2015 – Dec. 31, 2015 (if exceedance is in 2015)

Appendix C
Recommended Water Resources Policy Plan Amendment

POLICIES

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 Metropolitan Disposal System based on the designed peak-hour capacity of the interceptor(s) serving the community. 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.

IMPLEMENTATION STRATEGIES

- The Council will continue to use the current design standards for interceptors.
- The Council will develop inflow and infiltration goals for all communities based on the designed peak-hour capacity of the interceptor(s) serving the community as well as guidelines for the preparation of the local inflow and infiltration programs.
- The Council will ask all communities served by the MDES to begin the development and implementation of an inflow and infiltration program as soon as practicable and require the communities to include that program within their next comprehensive plan.

Communities with excessive I/I will need to develop plans that reduce their I/I. Communities currently within their I/I goals will need to develop plans for maintaining acceptable levels as the local infrastructure ages. The Council will provide the communities with a tool box of I/I reduction options that can be used by the communities in the preparation of their plans.

- Peak inflow during wet weather conditions will be measured by either the MCES metering system or by installation of temporary monitoring equipment in the sanitary sewer system.

The Council will use its metering system to monitor wet weather events and notify communities when their peak hourly flows exceed the I/I goals for their communities. Meter data by stormwater events are available and can be provided to the communities upon request to help them evaluate their sanitary sewer systems.

- The Council will require the community to reduce its inflow and infiltration to reach the design flow standard for each connection point to the MDS by no later than 2012.

Under the requirements of the Metropolitan Land Planning Act communities have three years to update their comprehensive plans once the Water Resources Management Policy Plan has been updated. Thus, the Council expects all communities to have an updated plan by 2008. As part of the comprehensive plan, the Council is requiring that the community include an I/I program that will study I/I issues and adopt a five-year schedule for improvements to their system to meet the I/I goals.

- The Council will limit increases in service within those communities where excessive inflow and infiltration jeopardizes MCES'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. MCES will work with those communities on a case-by-case basis, based on the applicable regulatory requirements.

If at any time the excessive I/I from a community reach a level that jeopardizes MCES's ability to convey wastewater without an overflow occurring, MCES will notify the community of the problem. If no timely solution can be found then the Council will recommend to the MPCA that no new sanitary sewer extensions should be approved until the issue is resolved

There are locations in the MDS where the excessive wet weather flow from several communities is using up the capacity designed for regional growth. But this growth restriction is not always limited to communities that aren't addressing their I/I problem. Other communities served by the same interceptor system that want to grow, and have either no excessive I/I or are taking action to eliminate excessive I/I, are also having their growth restricted. In these cases, the Council will provide wastewater conveyance facilities to serve both regional growth and to convey excessive I/I in the interim until the tributary communities achieve their I/I/ goals. Wherever possible the investment made to initially convey or treat the excessive I/I will be recovered to provide for long-term dry weather capacity for future growth as the excessive I/I is eliminated from the system.

- ~~MCES will work with communities to initiate an inflow and infiltration reduction program. Either option A or B listed below will be acceptable.~~

  ~~Option A – The Council will initiate an inflow and infiltration financial assistance/surcharge program. In order to provide financial assistance in 2008, the Council will initiate the surcharge program in 2007. This program will allow MCES to surcharge communities exceeding their inflow and infiltration goals in order to collect revenue for the community to use for solving its inflow and infiltration problem.~~

  ~~Option B – The Council will allow communities with an inflow and infiltration reduction program in place to continue with their programs and not participate in MCES's surcharge program. This will allow communities to undertake activities for inflow and infiltration reduction using local funds, as long as those funds are equal or greater than the surcharge program funds.~~

- MCES will work with communities to implement an initial inflow and infiltration reduction program during 2007 through 2011.

  MCES will estimate the cost of I/I reduction to eliminate the sources of excessive peak flows. MCES will allow communities to undertake work to reduce inflow and infiltration using local funds, as long as those funds equal or exceed the estimated cost of I/I reduction. If a community does not voluntarily undertake this work, MCES will add an equivalent surcharge to the community's municipal wastewater charges. Upon community request, MCES may allow communities to undertake up to 50% of its 2011 work during 2012.

~~The Council's Wastewater Treatment Master Plan has shown that the combination of increased flows from new development and the current levels of the excessive I/I entering the system during wet weather conditions has created an urgency to act now and eliminate the I/I from the system. To encourage a joint effort by all communities with excessive I/I to adopt and implement an I/I reduction program consistent with their 2008 comprehensive plan, the Council is proposing a Community Assistance Surcharge Program. Under the program, the Council will collect additional revenue from communities with excessive I/I and then use this revenue to support a program for I/I reduction.~~

~~Under the program communities could choose an alternative approach to "opt-out" of the formal surcharge program (i.e., undertake voluntary I/I reduction programs that are funded at the same or greater level). Under this approach, a community would enter into an agreement with MCES to obligate local funds to undertake the same or greater effort for I/I reduction.~~

- ~~Starting in 2013, the Council will limit future increases in wastewater service within those communities that have not met their inflow and infiltration goal(s), until the problem is solved. MCES will work with communities not meeting goals on a case-by-case basis.~~

~~The Council anticipates that all communities served by the MDS should be able to reduce their excessive I/I and meet the established I/I goals by 2012. If a community's I/I program has not been effective, and its excessive I/I reaches a level that either jeopardizes the ability of MCES to convey wastewater without an overflow occurring or limits the capacity in the system to the point where the Council can no longer provide additional wastewater services, MCES will notify the community of the problem. Meetings with the community will be held and attempts made to arrive at an acceptable local solution to the problem. If no timely solution can be found, then the Council will recommend to the MPCA that no new sanitary sewer extensions should be approved until the issue is resolved.~~

- ~~Starting in 2013, the Council will institute a wastewater rate demand charge program for those communities that have not met their inflow and infiltration goal(s). The intent of the program will be to help defray the cost of providing attention within the MDS to avoid overloading downstream facilities. MCES will continue to review communities' progress and work with them on a case-by-case basis.~~

- Starting in 2013, the Council will initiate an on-going, second phase of the I/I reduction program. Elements of the on-going program include: (1) continuation of the allowable peak hour flow by metershed approach; (2) adjustment of average baseline flow by metershed to normalize the effects of precipitation variability (drought and wet periods), to avoid penalizing communities for successful water conservation and I/I mitigation, and to account for growth; (3) adjustment of measured peak flow by subtracting estimated peak I/I into MCES interceptors in the metershed; and (4) continuation of appeal process that recognizes unusual conditions that contributed to a peak flow event, such as construction that may have temporarily allowed storm water entry into the sanitary sewer or other extraordinary circumstances.

- The Council may institute a wastewater rate demand charge for those communities that have not met their inflow and infiltration goals(s), if the community has not been implementing an effective I/I reduction program in the determination of the Council, or if regulations and/or regulatory permits require MCES 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 MCES conveyance and treatment facilities, plus the appropriate service availability charges for use of MCES conveyance and treatment facilities.

~~Finally, if a local solution to this problem is not found and implemented, a "demand charge" for not meeting the I/I goals will be implemented. The Council would design the needed improvement to avoid overloading downstream facilities. The cost to MCES to control the peak flow and provide flow attenuation at the point of connection would be assigned back to the community as a demand charge.~~

- The Council will work with the Public Facilities Authority to make funds available for inflow and infiltration improvements.

Currently, I/I projects on private property are not eligible for Public Facility Authority low-interest loans. I/I-related public projects typically receive a lower ranking than other public facility projects. The Council will support a change in the program or a new state program to facilitate discounted funding for all I/I removal projects.

Rates and Charges

POLICIES

The Council will design and adopt fees and charges using a regional cost-of-service basis:

- Municipal wastewater charges will be allocated to communities uniformly, based on flow. For communities determined by the Council to have excessive inflow and infiltration, surcharges and/or demand charges may be added.

- Industrial wastewater strength and load charge rates will each be uniform, and proportionate to the volume and strength of discharges.

- 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 and the average strength of the types of load.

- Service Availability Charges (SAC) will be uniform within the urban service area of the region. SAC for a Rural Growth Center where a treatment facility is owned by the Council will be based on the reserve capacity of the plan the Council's debt service specific to the Center. SAC for a Rural Growth Center where interceptor facility(s) are owned by the Council will be the urban SAC charge plus a charge based on the reserve capacity of the specific interceptor(s) and the Council's debt service specific to the Center.

The Council will seek customer input prior to, and give at least three months notice of, any material changes in the design of fees and charges.

METRO CITIES
Association of Metropolitan Municipalities

July 22, 2010

Ms. Wendy Wulff, Councilmember
Metropolitan Council
390 North Robert Street
St Paul, MN 55101

Dear Councilmember Wulff:

Thank you for the opportunity to comment on the proposed amendment to the Met Council's 2030 Water Resources Management Policy Plan. Metro Cities appreciates your work as Chair of the Inflow & Infiltration (I/I) Demand Charge Task Force as well as the work of MCES staff and members of the Task Force.

Overall, Metro Cities supports the recommendations and proposed amendment, particularly the recommendation to continue with a second phase I/I Surcharge Program in place of a demand charge program. Our policies have consistently opposed a demand charge. A demand charge would not be refundable and would not be used for the purposes of I/I mitigation but to build additional wastewater treatment capacity.

Continuing with an amended Surcharge Program appropriately allows the Met Council to continue working with communities to identify and undertake measures to reduce inflow and infiltration, using identified goals and benchmarks. Metro Cities believes that continuing this work with communities is a more productive and cost effective means to addressing I/I than assessing cities for the costs of additional capacity through a demand charge, which would be very costly for the region as a whole, and potentially hamper I/I mitigation efforts. With few exceptions, cities have undertaken mitigation efforts, and thus have not incurred surcharges, reflecting the commitment by cities to reduce I/I in their communities.

Metro Cities also supports the recommendations for changes in the program methodology to allow for more accurate and verifiable flow data and that normalize data over a longer period to account for variables in weather patterns. That said, we also recognize that the report does not address some community-specific needs and challenges around I/I work, and would request that the Council work with individual cities on issues specific to those communities, but that may fall outside the scope of the report, as I/I mitigation work continues.

I would also like emphasize the importance of recognizing the economic challenges associated with mitigating inflow and infiltration. Reducing I/I will take many years and continued financial investment to solve. Cities recognize the importance of addressing I/I and have expended significant resources in their mitigation efforts.

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As you know, Metro Cities requested and secured $3 million in bonding dollars for this purpose in the 2010 Legislature. The Council has also sought legislative support for the use of Clean Water funds for I/I mitigation.

Additional resources will be vital, as cities undertake increasingly difficult and expensive mitigation work, work that benefits our region and state from important economic, environmental and public safety standpoints.

Metro Cities would suggest that as the second phase of the surcharge program evolves, that the Council continue to re-examine the parameters of the program to assure that they are relevant and adaptable, as I/I mitigation work is completed and more data is available.

Thank you again for the opportunity to comment on the proposed amendment. I look forward to continuing work on this important issue with you and MCES staff.

Sincerely,

Patricia A. Nauman

Patricia A. Nauman
Executive Director

DEPARTMENT OF PUBLIC WORKS
Rich Lallier, Director

CITY OF SAINT PAUL
Christopher B. Coleman, Mayor

Bruce Elder, Sewer Utility Manager
700 City Hall Annex
25 West Fourth Street
Saint Paul, MN 55102
(651) 266-6234
FAX (651) 298-5621

July 12, 2010

Mr. Bryce Pickart, P.E.
MCES Manager, Engineering Planning
390 Robert Street North
Saint Paul, MN 55101-1805

Re: MCES Inflow and Infiltration (I/I) Surcharge Program
Comments Concerning City of Saint Paul

Dear Mr. Pickart:

In May 2010, the Council presented a draft Demand Charge Task Force Report that described how the Council intends to implement a Demand Charge for excessive inflow/infiltration (I/I) entering the regional system. The Council originally expected to implement this Demand Charge in 2013. The new draft plan describes an approach that allows communities to continue working on their I/I situation without receiving a demand charge so long as I/I program spending is in line with the community's excessive I/I surcharge amount. While the City supports this key shift in direction regarding the demand charge, the City also desires to take this opportunity to comment on the draft plan as it pertains to the City's specific situation. A number of these comments have been transmitted to the Council in the past, and as they are important to all parties, we are reiterating them now.

Primarily, the Council is interested in reducing peak flow that causes exceedences of the regional system's capacity to convey wastewater to the treatment plants without overflow. The program designed to achieve this objective uses the Council's historical flow design standard to establish what is excessive peak flow and the Council's metering system to determine each community's status relative to the standard. As the City has stated in previous letters, the City's position is that the current metering program used to determine compliance with this design standard is not sufficient to diagnose the problem in the City and will not provide sufficient information to determine compliance after efforts to reduce flows have been performed. As a result, this current situation will lead to inefficient progress and inconclusive evidence of compliance. The City believes that the May 2010 Demand Charge Program allows for a more efficient and conclusive process to be undertaken, but doing so will require some effort and expense on behalf of the Council. This letter details the City's request, and the specific points are as follows:

- Council's 2010 Demand Charge Program Is Based on Metershed-Level Compliance

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- Current Metershed Definition for the City of St. Paul Lacks Detail
- Current City Metershed Definition Will Hamper Ability to Make Progress
- Council Understands Actions Required to Improve Metering System for St. Paul
- City Is Committed to Reducing Peak Flows But Needs Data to Determine Progress
- No Change on City Metershed Definition Will Hamper Ability to Make Progress

Council's 2010 Demand Charge Program Is Based on Metershed-Level Compliance
The May 2010 Demand Charge Task Force Report, page 3, states:

> "I/I reduction goals for communities will be set based on an allowable peak hour flow (PHF). These goals will continue to be set on a metershed basis. If a community has multiple metersheds, the community will have an allowable PHF for each metershed."

In addition, the May 2004 I/I Task Force Report, page 48, described the I/I Task Force recommended Implementation Strategy. A list of action Council action items included:

> "3. Develop I/I goals for all Communities as well as guidelines for the preparation of local I/I programs.
>
> 4. Require the community to reduce its I/I to reach the design flow standard for each connection point to the Metropolitan Disposal System..."

Clearly, both the original Task Force and the current Demand Charge Task Force viewed compliance to be monitored and achieved at a much smaller scale than a community-wide basis. Unfortunately for the City, St. Paul's community-wide and metershed based numbers are the same. As will be made clear in this letter, this fact represents significant challenges for the City to comply with the peak flow standard.

Current Metershed Definition for the City of St. Paul Lacks Detail
The City discharges to the MCES system at over **250** locations, and the corresponding tributary areas (sewer-sheds) range in size from a few acres to more than 4,000 acres. One downstream point (Metro Plant) and 20 upstream metering points define the St. Paul metershed. At over 42 square miles, the City represents the single largest metershed in the Council's service area by far. As such, this single city-wide metershed is only allowed a peaking factor of 1.8, which translates to a maximum allowable peak flow of 60 mgd.

By contrast many other, much smaller, communities have smaller and much better metersheds. This will allow them to better understand their compliance status and understand the effect their efforts are having in reducing their peak flows. Our consultant, Brown and Caldwell, previously evaluated flows from MCES meters located at the City's sewer service boundaries.

For those meters, the corresponding allowable wet weather peaking factors (based on the estimated average and Council's design curve) would all be 2.2 or more, except for the large meters M101A and B which measure Joint Interceptor flows downstream of Minneapolis's flow input. Twelve of these perimeter meters would be allowed wet weather peaking factors greater than 2.7.

Using a single, large-area metershed to define St. Paul's compliance status puts the City at a significant disadvantage when faced with complying with the Council's standard. Since February 7, 2008, the City has been collecting dry weather flow data from its largest metershed which has an area of about 4,070 acres. By analyzing the flow data from February 17 to March 13, 2008, Brown and Caldwell calculated the following flow conditions for this metershed:

- Average Dry Weather Flow = 2,100 gpm (3.0 MGD)
- Peak Dry Weather Flow = 3,470 gpm
- Dry Weather Peaking Factor = 1.65 (3,470/ 2,100)
- Allowable Wet Weather Peaking Factor = 2.6 (using Met Council peaking factor curve and an average dry weather flow of 3.0 MGD)

For this metershed there would very little room for I/I when the dry weather peaking factor of 1.65 is compared to an allowable wet weather peaking factor of 1.8, the value the City is currently held to using the city-wide metershed approach.

Finally, using Metro Plant data compared to upstream meters is prone to potential errors, not least of which is related to the risk of missing data upstream. If a single large meter, such as M101A/B, were out of service during a significant flow event, the Council would be unable to determine conclusively the City's compliance status.

A legitimate approach for providing greater detail that can be used for determining the City's compliance status would rely upon the Council to install a significant number of new flow meters. While this will certainly require capital and O&M expenditures by the Council, the alternative of keeping the status quo is likely many more times expensive as it will result in inefficient flow reduction activities by the City.

Council Understands Actions Required to Improve Metering System for St. Paul

At several points during the development of the I/I Surcharge Program, both the Council and the City undertook efforts to understand better the amount of peak I/I entering the regional system from the City system. Most recently, in 2008, the Council and the City were in discussions regarding the deployment of additional metering that would improve the characterization of the City's peak flow discharges. While the Council has deployed additional meters within the City via MCES's Northeast Interceptor Project, the Council has not yet fully implemented a metering strategy on a City wide basis. **This letter reaffirms the City's request to the Council to install more meters, thereby establishing new metershed compliance points for the City.**

The City Is Committed to Reducing Peak Flows But Needs Data to Determine Progress
Since data are required to determine progress when implementing an I/I reduction program, it would be appropriate to use the same data to determine compliance. Full-fledged I/I programs include a periodic evaluation of progress to determine cost-benefit of efforts to date and determine remaining priority activities. Ideally the data used for this purpose by the City would also be the data the Council will use to evaluate compliance status. If the Council continued to use the Metro plant service area as the basis, the City and the Council would be evaluating progress from two completely different perspectives.

No Change on City Metershed Definition Will Hamper Ability to Make Progress
Without a change in the current metershed definition for the City, it will take years to determine whether the efforts implemented have had any meaningful peak flow reduction. Council staff can certainly appreciate the challenges that come with waiting years to see the results of significant investments. Changing the metershed definition and installing new meters will provide the necessary data for determining progress early in the program's life cycle and give assurances to the Council that the City can gradually meet compliance across the service area.

Please contact me at 651-266-6248 if you have any questions or comments. Thank you for your time and consideration in reviewing our request.

Sincerely,

Bruce Elder
Sewer Utility Manager
Department of Public Works
700 CHA, 25 West 4th Street
Saint Paul, MN 55102.

C: Wendy Wulff, Met Council, District 16 Council Member
Kirstin Serland Beach, Met Council, District 14 Council Member
Richard Aguilar, Met Council, District 13 Council Member
William Moore, General Manager, MCES
Jason Willet, MCES Finance Director
Anne Mulholland, Deputy Mayor, City of Saint Paul
Rich Lallier, Director of Public Works, City of Saint Paul
John Maczko, City Engineer, City of Saint Paul

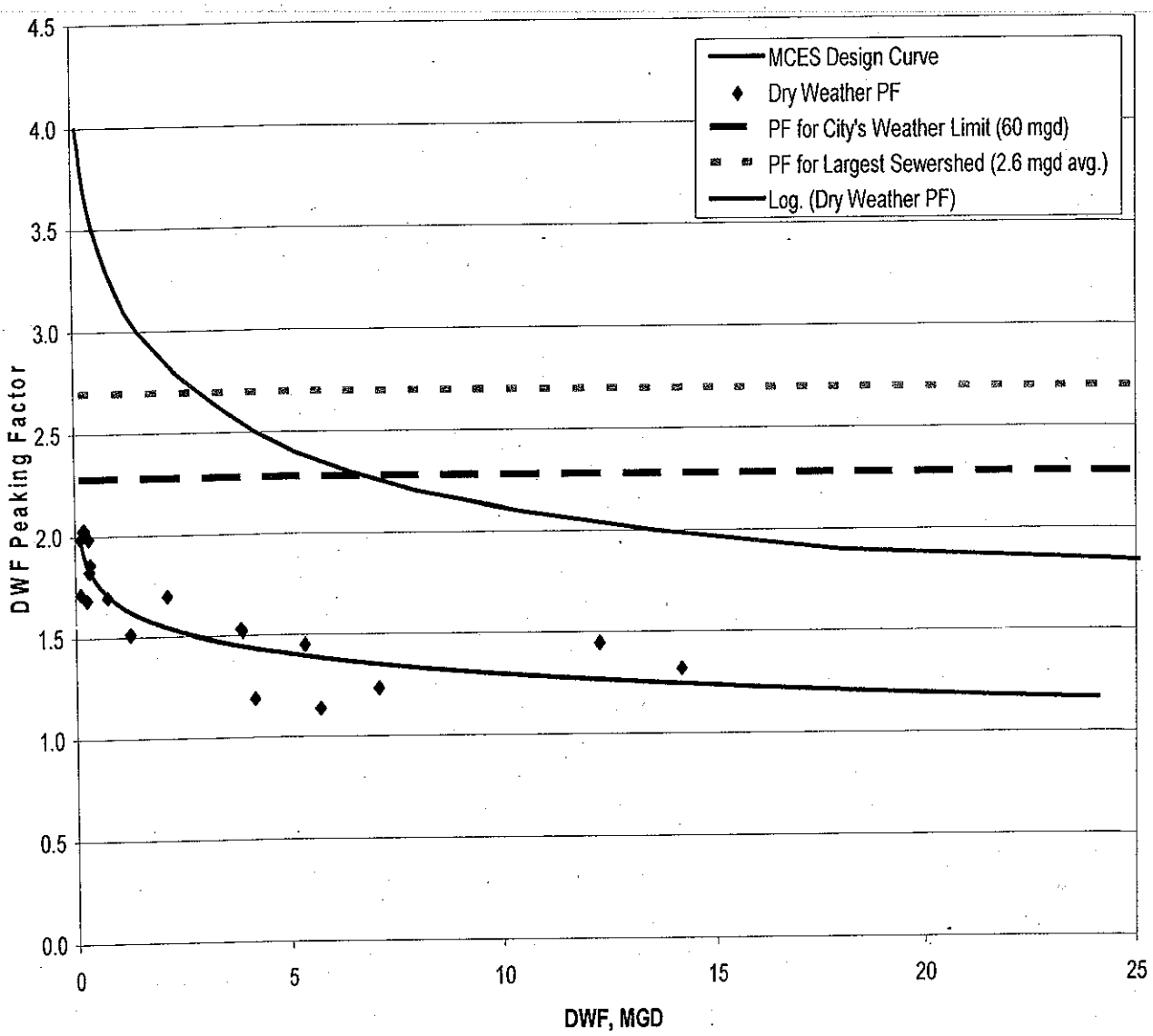
Attachments:
- Table 1- Dry and Allowable Wet Weather Peaking Factors- MCES Meters
- Peaking Factor Graph - Meters Upstream of St. Paul Service Area

Table 1. Estimated Actual Dry and Allowable Wet Weather Peaking Factors

Meter	Average daily flow, MGD	Peak dry weather flow, MGD	Dry Weather Peaking Factor	Allowable Wet Weather Peaking Factor[1]
M002	2.09	3.6	1.7	2.8
M004	0.35	0.7	1.9	3.6
M005	0.22	0.5	2.0	3.8
M007	0.12	0.2	1.7	3.9
M008	0.32	0.6	2.0	3.6
M010	1.26	1.9	1.5	3.0
M011	0.73	1.2	1.7	3.3
M015	0.19	0.4	2.0	3.9
M016	0.33	0.6	1.8	3.6
M025	3.79	5.8	1.5	2.5
M025A	3.83	5.8	1.5	2.5
M035A	7.06	8.7	1.2	2.2
M046	5.31	7.7	1.5	2.3
M047	0.22	0.4	2.0	3.8
M056	0.13	0.3	2.0	3.9
M057	0.27	0.5	1.7	3.7
M101A	14.12	18.7	1.3	1.9
M101B	12.20	17.7	1.4	2.0
M102A	4.12	4.9	1.2	2.5
M102S	5.68	6.5	1.1	2.3

[1]Based on the average flow for December 2000 according to the Council's design curve.

Year 2000 Dry Weather Flow Peaking Factor for Meters Upstream of St. Paul Service Area (December 15-21, 2000)



CITY OF BAYPORT
294 NORTH THIRD STREET
BAYPORT, MINNESOTA 55003
PHONE 651-275-4404 FAX 651-275-4411

July 27, 2010

Metropolitan Council
390 Robert St. North
St. Paul, MN 55101-1805

Dear Council Members:

The City of Bayport is looking forward to taking advantage of the distribution of the inflow and infiltration (I/I) grant funds which were signed into law as part of the 2010 bonding bill. As you know, the provisions of the bonding dollars for this purpose is an accurate reflection of some of the important issues of I/I mitigation across our region. That being said, we are eager to have the dollars put to their intended use.

The City of Bayport recognizes the importance of the reporting requirements required in order to participate in the I/I grant program. Unfortunately, the application process has become a strenuous and discouraging course of action for our city. Reflective of the current economic times, the City of Bayport has incurred significant financial cost to address this critical issue. As a result of the burdensome reporting requirements, the application process has become significantly taxing for cities, such as Bayport, to have an opportunity for obtaining the funds in order to provide important cost and environmental benefits to our region.

While we understand additional work remains to be done to get a feasible grant program started, we would like to underscore the importance of expediting this process so that cities can plan for critical inflow and infiltration mitigation work on their public infrastructure. The beneficial economic and environmental returns for the investment are dependent on the timely process of the updates to the grant distribution process.

The City of Bayport would like to express our thanks to you and your staff for your assistance and accomplishments to date. We appreciate the work done by Metro Cities and the Metropolitan Council Environmental Services staff to ensure an expedient and equitable process for distributing these funds, so that mitigation work can proceed in a practical and cost-effective manner. The City of Bayport encourages you to continue working at an accelerated pace to ensure a fair process for the disbursement of the I/I grants. If you have any questions or comments, please contact the City of Bayport at 651-275-4404.

Sincerely,

Yaminah Oliver, Administrative Intern
Email: yoliver@ci.bayport.mn.us