

E Environment Committee

Item: 2010-282

For the Metropolitan Council meeting of September 8, 2010

ADVISORY INFORMATION

Date Prepared: August 25, 2010

Subject: Adoption of Amendment to Water Resources Management Policy Plan,
Infiltration/Inflow Program

Proposed Action:

That the Metropolitan Council adopts the attached amendment to the 2030 Water Resources Management Policy Plan, Infiltration/Inflow Program.

Summary of Committee Discussion / Questions:

Relative to discussion of improving the metering system for the City of Saint Paul, Council Member Leppik asked if it is difficult and expensive to install temporary meters. Staff stated that the Council and both Saint Paul and Minneapolis have a few temporary meters installed at the moment to help quantify infiltration/inflow reserve capacity. The hydraulics may be challenging in some cases, and it can be expensive, depending on what's involved. Staff believes there needs to be more study in Saint Paul's case, including additional permanent meters versus temporary meters.

Leppik commented that this is a good approach, and thanked Council Member Wulff for chairing the Demand Charge Task Force. Wulff stated that this was collaborative process over a long period of time, and the task forced recognized that the current program is working and it made sense to continue.

Motion to approve the proposed action was made, seconded, and passed unanimously.

E Environment Committee

Business Item
Item: 2010 - 282

Meeting date: August 24, 2010

For the Metropolitan Council meeting of September 8, 2010

ADVISORY INFORMATION

Date:	July 23, 2010
Subject:	Adoption of Amendment to Water Resources Management Policy Plan, Infiltration/Inflow Program
District(s), Member(s):	All
Policy/Legal Reference:	Water Resources Management Policy Plan
Staff Prepared/Presented:	Bryce Pickart 651-602-1091
Division/Department:	MCES c/o William G. Moore 651-602-1162

Proposed Action

That the Metropolitan Council adopts the attached amendment to the 2030 Water Resources Management Policy Plan, Infiltration/Inflow Program.

Background

The 2030 Water Resources Management Policy Plan includes a program whose objective is to eliminate excessive infiltration/inflow (I/I) to the regional wastewater system. Excessive I/I uses capacity that is intended to serve future development. The first phase of the I/I reduction program is a voluntary effort by communities to eliminate sources of I/I into the public sewer system, as well as private sources of I/I, such as service lines, sump pumps, foundation drains, and rainleaders.

The second phase of the I/I program is a demand charge program, which implies construction of storage facilities and subsequent conveyance and treatment of excessive I/I. The costs of storage, conveyance, and treatment would be recovered by a demand charge paid by the community with excessive I/I. The demand charge program is scheduled to begin in 2013, based on concerns about available capacity to serve planned development.

In August 2009, the Council appointed a task force of 18 customer community representatives, chaired by Council member Wendy Wulff, to develop recommendations regarding the timing and details of a demand charge program and other elements of the I/I program. The task force meeting recommendations are consistent with the proposed amendment to the Policy Plan, which is attached.

Key elements of the proposed amendment:

1. Add an ongoing I/I Reduction Program beginning in 2013.
Rationale: Updated analysis of regional wastewater system capacity indicates that capacity is adequate for several years longer than the previous analysis. Further, I/I reduction is part of ongoing infrastructure maintenance.
2. Revise the demand charge program, using "trigger" criteria instead of a date for implementation.
Rationale: Conveyance and treatment of excessive I/I should be a "last resort" to address regulatory compliance or community inaction.

A public hearing was held on July 13, 2010. Comments included: (1) Patty Nauman, Metro Cities and task force member, supported the proposed amendment, with the understanding that another program evaluation and task force will be appropriate in several years; (2) Bruce Elder, St. Paul task force member, expressed the city's request for additional meters to help ensure that the most cost-

effective areas for I/I mitigation can be identified; and (3) Lisa Cerney, Minneapolis task force member, expressed the city's special circumstances with its original combined sewers, its regulatory status, and the appropriateness of the Council's standard flow peaking factors.

MCES staff is revising its draft task force report to address several issues that have been raised by Minneapolis, St. Paul, and other task force communities, 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 in the procedures for the on-going I/I program and in the next Policy Plan update.

The proposed Policy Plan amendment has been revised to: (1) add a reference to applicable regulatory requirements; (2) add the Task Force's recommendation to allow a community to undertake up to 50% of its 2011 I/I work in 2012; and (3) omit the specific duration of I/I mitigation under the ongoing I/I program, i.e. details will be addressed in the updated I/I procedures manual.

Rationale

Amendments to Policy Plans/System Plans require Council action.

Funding

N/A

Known Support/Opposition

The Council-appointed Infiltration/Inflow Demand Charge Task Force recommendations are consistent with the proposed amendment to the Policy Plan.

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.



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.


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
Executive Director



CITY OF SAINT PAUL
Christopher B. Coleman, Mayor

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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.**

Letter to Bryce Pickart
MCES I&I Surcharge Program
Comments Concerning City of St. Paul
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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

¹Based 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)

