

2012 Annual Report
Combined Sewer System in Minneapolis and St Paul
April, 2013

Table of Contents

Topic	Section
Summary	I
Metropolitan Council Environmental Services	II
City of Minneapolis	III

Section I. Summary

A. *Purpose of Report*

The purpose of this report is to meet the requirements of Part II.A.3 of the National Pollutant Discharge Elimination System/State Disposal System (NPDES/SDS) Permits issued to the City of Minneapolis, and Metropolitan Council, (Permit No. MN0046744) and to the City of Saint Paul, and Metropolitan Council (Permit No. MN0025470) (Permittees).

The report contains information regarding permit administration, regulator monitoring results, maintenance of the regulators, outfalls, and combined sewers, improvements to the interceptor system, optimization of combined sewer overflow control, city sewer separation programs, rain leader elimination programs, progress in meeting other permit requirements, and a summary of special problems encountered during 2012. The report is intended to consolidate the activities of each of the three (3) joint Permittees.

B. *NPDES/SDS Permits*

The Combined Sewer Overflow (CSO) NPDES/SDS Permits MN0046744 and MN0025470 were reissued on February 26, 1997; these permits expired on June 30, 2001. Applications for reissuance of the permits were submitted on December 28, 2000 and to date have not been acted on by the Minnesota Pollution Control Agency (MPCA).

C. *Metropolitan Council Environmental Services*

Metropolitan Council Environmental Services (MCES) monitored ten regulators in Minneapolis and Saint Paul during 2012. Additionally, MCES continued with previously required interceptor and regulator maintenance functions during 2012. Overflow duration and volume at the regulators and overflow sites, as well as the interceptor and regulator maintenance activities, are reported monthly and summarized herein.

D. *City of Minneapolis*

See Section III of this Report for the complete portion detailing the Combined Sewer Overflow (CSO) Program in the City of Minneapolis.

E. *City of St Paul*

The City of Saint Paul has reported the completion of their CSO separation effective June 30, 2001. The MPCA (as reported by the City of St. Paul in 2001) has indicated that reporting from the City is no longer required. The City subsequently requested termination of NPDES/SDS Permit No. MN0025470 in 2006; the termination request has not been acted on as of the date of this report.

Section II. Metropolitan Council Environmental Services 2012 Activities and Progress

A. *Operational Plan*

General operation of the Combined Sewer System is described in the operational plan, which was approved by the MPCA on May 11, 1987. An amendment to the plan was submitted to MPCA in April 1991. A second amendment to the plan was submitted to MPCA on May 11, 2004. This Plan remains in effect under the continuing NPDES/SDS permits.

B. *Regulators Eliminated in 2012*

None.

C. *Monitoring Summary*

All regulators in Minneapolis and Saint Paul are monitored continuously by means of level sensing systems and are visually inspected at least twice a month and after every 0.2" rainfall event. A list of the monitored sites is provided below:

Minneapolis

1. R04 (1-37) Minnehaha Parkway & 39th Ave. S.
2. R06 (5-34) Northwest Meters
3. R07 (20-17) Portland Ave. S. & Washington Ave
4. R08 (7-33) E. 26th & Seabury
5. R10 (4-34) Southwest Meters
6. R12 (6-48) East Meters
7. R14 (2-35) East 38th St. & 26th Ave.
8. R20 Oak & 5th St. (city regulator)

St. Paul

1. R02 (33-100A) 3rd & Commercial
2. R05 (001A) East Tunnel Joint Interceptor Relief

Telemetry systems at the remotely monitored regulators send the level signal to a computer system located at the MCES Regional Maintenance Facility (RMF) in Eagan. Data is stored, collected, and analyzed at RMF to compute overflow duration and volume for each event. Estimated overflow volume is computed using hydraulic formulas applicable to the geometry of each regulator. Monthly regulator reports have been submitted to the



MPCA in accordance with Part I.C.1 of the Minneapolis CSO permit.

Caution is advised regarding use of the flow data. The instrumentation and weir configurations at the monitored sites are hydraulically unsuitable for highly accurate flow measurement; the error at any site may therefore be in the magnitude of 10% to 15%. Reported volumes are approximate calculations.

Ten (10) recording-type rain gauges are operated in the area tributary to the respective regulators. Rainfall data from these sites are telemetered to the computer system at RMF.

D. Maintenance Program

Each NPDES/SDS permit requires routine inspection of regulators and/or outfalls. Attachment A to each permit specifies inspection frequency and responsible party (MCES or City). Inspection frequency for the regulators and/or outfalls is based on a combination of factors including overflow volume, overflow frequency, and maintenance history.

Every MCES regulator is inspected after each 0.2-inch rainfall event and twice per month. During each inspection the level-sensing instrument in the monitored regulators is inspected. Repairs and/or removal of obstructions are completed as needed. **Table 6** below, shows the dates and results of physical inspections took place on the MCES regulators.

E. Inflow/Infiltration(I/I) Surcharge Program

The Metropolitan Council has established I/I goals for all communities discharging wastewater to the Metropolitan Disposal System (MDS) based on the design peak-hour capacity of the interceptor(s) serving the community. Communities that have excessive I/I in their sanitary sewer systems are required to eliminate the excessive I/I within a reasonable time period.

Since June of 2004, each community that experienced flow rates in excess of its maximum allowable rate in any of its metersheds has received a surcharge payable to MCES under this program. The communities had the option to commit to I/I reduction programs and expend funds, equal to or greater than the amount of the surcharge they were assigned. All communities deemed to have excessive I/I chose to commit to perform I/I reduction in lieu of paying MCES.

F. Capital Improvements and Studies

In 2011, work on 3rd and Commercial (R02) was bid with construction initiated in 2012. The work of this project consists of installing new sluice gates, electrical equipment, and a standby



generator. Additionally, concrete surfaces will be restored and corrosion resistant coatings will be applied. This work was summarized in the 2010 Regulator Evaluation and Planning study. Additional development of improvement concepts for the remaining regulator sites was completed in 2012.

Table 1 below, describes the removal schedule in the permits.

Table 1. Metropolitan Council Environmental Services Regulator Removal Schedule

NPDES Outfall No.	Regulator Code	MCES No.	Name and/or Location	Removal Status
Minneapolis Regulators				
001	1-37	R04	Minnehaha Tunnel Outfall Minnehaha Pkwy. & 39th Ave S.	A
002	2-35	R14	East 38th St. Outfall East 38th St. & 26th Ave. S.	A
004	4-34	R10	Southwest Interceptor Outfall Southwest Meters Diversion	B
005	5-34	R06	Northwest Interceptor Outfall Northwest Meters Division	B
006	6-48	R12	Eastside Interceptor Outfall East Meters Division	B
007	7-33	R08	East 26th St. Outfall East 26th St. & Seabury Ave.	A
020	2-17	R07	Chicago Ave. S. & N. Mpls Tunnel Outfall Portland Ave. S. & Washington	B
012	12-28b*	R20	Oak St. Southeast Outfall Oak St. & 5th St. SE	A
St. Paul Regulators				
001A	001A	R05	MEI Joint Pressure Relief Outfall Joint Interceptor at River Crossing	A
033	33-100A	R02	Plum (Troutbrook) St. Outfall Third and Commercial	B

*Replaced Original 12-28B

Removal Status for Combined Sewer Overflow Regulators

A: Monitoring is required before elimination can be scheduled.

B: Additional monitoring is required; may be necessary to remain as an emergency outfall.

G. 2012 Regulator Performance

Last year there were zero overflows to the river recorded from the ten monitored regulator sites. By comparison, in 1984 at the start of the separation program there were 18 monitored regulator sites, which recorded 77 overflow events and over 1 billion gallons of overflow.

A comparison of overflow events from telemetered regulators for the last six years is presented in **Figure 2** and **Table 3**. An average of 0.33 overflow events from telemetered sites have occurred per year over the last six years; however, zero overflow events occurred in 2007, 2008, 2009, 2011 and 2012. Additionally, data for 2012 overflow duration is



presented in Table 4 and data for 2012 overflow volumes is presented in **Table 5**.

Table 6 summarizes the inspection results for the regulators in Minneapolis and **Table 7** summarizes the inspection results for the regulators in St. Paul. Inspections occurred according to the prescribed schedule or based on rainfall amount. Observed overflows are indicated with “Yes;” however, no overflows were observed during the reporting period.

Figure 2. Telemetered Regulators - Overflows to the River over the Last Six Years

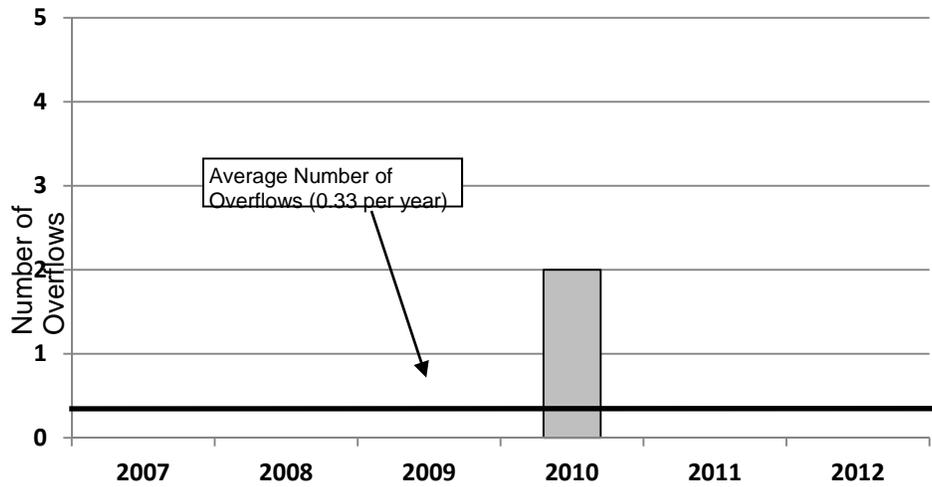


Table 3. Telemetered Regulators - Overflows to the River over the Last Six Years

MCES Designation	Regulator Code	Regulator Sites	2007	2008	2009	2010	2011	2012
R02	33-100A	3rd & Commercial	0	0	0	0	0	0
R04	1-37	39th-Minnehaha	0	0	0	0	0	0
R06	5-34	Northwest Meters	0	0	0	2	0	0
R07	2-17	Portland-Washington	0	0	0	0	0	0
R08	7-33	26th-Seabury	0	0	0	0	0	0
R10	4-34	Southwest Meters	0	0	0	0	0	0
R12	6-48	East Meters	0	0	0	0	0	0
R05	001A	MEI Joint Interceptor Relief	0	0	0	0	0	0
R14	2-35	38th St.&26th	0	0	0	0	0	0
R20	2-28b	Oak St. & 5th St SE	0	0	0	0	0	0
		Totals	0	0	0	2	0	0

Table 4. Telemetered Regulators - MCES Regulator Monitoring Summary for 2012 (Overflow Duration, Hours)

MCES Designation	Regulator Code	Regulator Name	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
R02	33-100A	3rd & Commercial	0	0	0	0	0	0	0	0	0	0	0	0
R04	1-37	39th & Minnehaha	0	0	0	0	0	0	0	0	0	0	0	0
R06	5-34	Northwest Meters	0	0	0	0	0	0	0	0	0	0	0	0
R07	2-17	Portland & Washington	0	0	0	0	0	0	0	0	0	0	0	0
R08	7-33	26th & Seabury	0	0	0	0	0	0	0	0	0	0	0	0
R10	4-34	Southwest Meters	0	0	0	0	0	0	0	0	0	0	0	0
R12	6-48	East Meters	0	0	0	0	0	0	0	0	0	0	0	0
R05	001A	MEI Joint Interceptor Relief	0	0	0	0	0	0	0	0	0	0	0	0
R14	2-35	38thSt. &26th	0	0	0	0	0	0	0	0	0	0	0	0
R20	12-28b	Oak St & 5th St SE	0	0	0	0	0	0	0	0	0	0	0	0
		Total	0	0	0	0	0	0	0	0	0	0	0	0

(This portion of the page is intentionally blank.)

Table 5. Telemetered Regulator - MCES Regulator Monitoring Summary for 2012 (Overflow Volume, Million Gallons)

MCES Designation	Regulator Code	Regulator Name	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
R02	33-100A	3rd & Commercial	0	0	0	0	0	0	0	0	0	0	0	0
R04	1-37	39th & Minnehaha	0	0	0	0	0	0	0	0	0	0	0	0
R06	5-34	Northwest Meters	0	0	0	0	0	0	0	0	0	0	0	0
R07	2-17	Portland & Washington	0	0	0	0	0	0	0	0	0	0	0	0
R08	7-33	26th & Seabury	0	0	0	0	0	0	0	0	0	0	0	0
R10	4-34	Southwest Meters	0	0	0	0	0	0	0	0	0	0	0	0
R12	6-48	East Meters	0	0	0	0	0	0	0	0	0	0	0	0
R05	001A	MEI Joint Interceptor Relief	0	0	0	0	0	0	0	0	0	0	0	0
R14	2-35	38thSt. &26th	0	0	0	0	0	0	0	0	0	0	0	0
R20	12-28b	Oak St & 5th St SE	0	0	0	0	0	0	0	0	0	0	0	0
		Total	0	0	0	0	0	0	0	0	0	0	0	0

(This portion of the page is intentionally blank.)

Table 6. MCES Regulator Inspections - Minneapolis – 2012

Date	R04 -- Minnehaha Parkway & 39th Ave. So.	R06 -- Northwest Meters	R07 -- Portland Ave. So. & Washington	R08 -- E. 26th & Seabury	R10 -- Southwest Meters	R12 -- East Meters	R14 -- East 38th St & 26th Ave	R20 -- Oak & 5th St.
Overflow (Yes or No)								
1/3/2012	No	No	No	No	No	No	No	No
1/19/2012	No	No	No	No	No	No	No	No
2/21/2012	No	No	No	No	No	No	No	No
3/1/2012	No	No	No	No	No	No	No	No
3/13/2012	No	No	No	No	No	No	No	No
3/20/2012	No	No	No	No	No	No	No	No
3/23/2012	No	No	No	No	No	No	No	No
4/16/2012	No	No	No	No	No	No	No	No
5/2/2012	No	No	No	No	No	No	No	No
5/04/2012	No	No	No	No	No	No	No	No
5/7/2012	No	No	No	No	No	No	No	No
5/21/2012	No	No	No	No	No	No	No	No
5/25/2012	No	No	No	No	No	No	No	No
5/29/2012	No	No	No	No	No	No	No	No
6/11/2012	No	No	No	No	No	No	No	No
6/19/2012	No	No	No	No	No	No	No	No
7/3/2012	No	No	No	No	No	No	No	No
7/16/2012	No	No	No	No	No	No	No	No
7/19/2012	No	No	No	No	No	No	No	No
7/30/2012	No	No	No	No	No	No	No	No
8/6/2012	No	No	No	No	No	No	No	No
8/16/2012	No	No	No	No	No	No	No	No
9/13/2012	No	No	No	No	No	No	No	No
9/18/2012	No	No	No	No	No	No	No	No
10/15/2012	No	No	No	No	No	No	No	No
10/26/2012	No	No	No	No	No	No	No	No
11/07/2012	No	No	No	No	No	No	No	No
11/13/2012	No	No	No	No	No	No	No	No
12/10/2012	No	No	No	No	No	No	No	No
12/24/2012	No	No	No	No	No	No	No	No

Table 7. MCES Regulator Inspections – St. Paul – 2012

Date	R02 -- 3rd & Commercial	R05 MEI -- Joint Interceptor Relief
Overflow (Y or N)		
1/3/2012	No	No
1/19/2012	No	No
2/21/2012	No	No
3/1/2012	No	No
3/12/2012	No	No
3/20/2012	No	No
3/23/2012	No	No
4/16/2012	No	No
5/02/2012	No	No
5/4/2012	No	No
5/7/2012	No	No
5/21/2012	No	No
5/25/2012	No	No
5/29/2012	No	No
6/11/2012	No	No

Date	R02 -- 3rd & Commercial	R05 MEI -- Joint Interceptor Relief
Overflow (Y or N)		
6/19/2012	No	No
7/3/2012	No	No
7/16/2012	No	No
7/19/2012	No	No
7/30/2012	No	No
8/6/2012	No	No
8/16/2012	No	No
9/13/2012	No	No
9/18/2012	No	No
10/15/2012	No	No
10/26/2012	No	No
11/7/2012	No	No
11/13/2012	No	No
12/10/2012	No	No
12/24/2012	No	No

(This portion of the page is intentionally blank.)



Section III. City of Minneapolis 2012 Activities and Progress

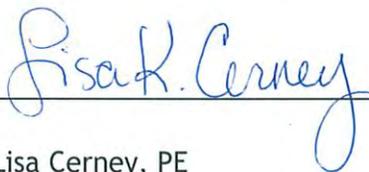




ANNUAL REPORT ON 2013 MINNEAPOLIS COMBINED SEWER OVERFLOW PROGRAM & 2012 ACTIVITIES

APRIL 9, 2012

I hereby certify that this plan, specification, or report, was prepared by me or under my direct Supervision and that I am a duly Registered Professional Engineer under the laws of the State of Minnesota.



Lisa Cerney, PE

Minneapolis Public Works, Surface Water & Sewers
Registration No. 42688



Table of Contents

NPDES/SDS Combined Sewer Overflow Permit Background.....	3
Sewer Separation History In Minneapolis	3
CSO Program - Current Status and Progress	4
2012 Completed CSO Projects	9
Additional CSO Program Activities.....	10
Minneapolis Flood Mitigation Program	10
Sanitary Sewer Collection System.....	11
Storm Drain Collection System.....	12
System Challenges	13
Future Improvements	13

List of Figures

Figure 1 - 2012 Combined Sewer Separation Projects	5
Figure 2 - Rainleader Disconnection Program Status	6
Figure 3 - CSO Volume/Precipitation Comparison (1984-2012) - Minneapolis	7
Figure 4 - 1-MN-341 Meter Data, Site 10X-3 (15 th Ave S & 37 th St E).....	10

April 9, 2013

NPDES/SDS Combined Sewer Overflow Permit

The 1972 amendments to the Federal Water Pollution Control Act (also known as the Clean Water Act) provided the statutory basis for the National Pollutant Discharge Elimination System (NPDES) permit program. The NPDES program is designed to regulate the discharge of pollutants from point sources to waters of the United States. The Minnesota Pollution Control Agency (MPCA) has issued joint NPDES Combined Sewer Overflow (CSO) permits to the City of Minneapolis (City) and Metropolitan Council Environmental Services (MCES) since 1985.

These permits regulate CSOs by defining certain conditions that should be followed if an overflow event from the sanitary system occur, including:

- Keeping detailed records of the number of CSO events
- Maintaining overflow volume data
- Maintaining operation and maintenance data for overflow events and elimination efforts
- Cooperation of both joint permittees is also maintained

A separate inter-agency agreement between the City and MCES details each permittee's responsibilities with respect to operation of the collection system, and notification in the event of a CSO from the sanitary sewer system.

The most recent CSO permit was issued on February 26, 1997 and expired on June 30, 2001 (Permit MN 0046744). The City and MCES applied to renew this permit in December of 2000, and began negotiating with the MPCA regarding the terms for a new permit. The City has continued to operate under the expired permit requirements, and has developed a plan to control CSOs, including an aggressive approach to eliminate connected areas and appropriate operation and maintenance of the system(s).

Sewer Separation History in Minneapolis

The oldest Minneapolis sewers were built in 1870, and were designed to carry both sewage and stormwater. In 1922, construction started for a separate storm drain system around Minneapolis lakes, as well as newly developing areas. Older areas continued to be served by combined sewers. Sewer separation began in earnest in the 1960s, in conjunction with a citywide paving program.

In 1986, the City began an accelerated sewer separation program called **Minneapolis Combined Sewer Overflow Program - Phase I**. CSOs were greatly reduced by Phase I efforts. Phase I included the construction of storm infrastructure to disconnect stormwater runoff from 4,600 acres tributary to the sanitary sewer system. The Phase I program was supported in part by federal and state funds.

April 9, 2013

The Minneapolis Combined Sewer Overflow Program – Phase II was developed in 2002, based on a 1999/2000 comprehensive planning process and an April 2002 Brown & Caldwell study entitled ***Combined Sewer Separation Evaluation***. The study identified *inflow*, rather than *infiltration*, as the major contributor to CSOs. The 2002 study recommended that Minneapolis:

- Disconnect public sector inflow sources: isolated catch basins (storm drain inlets), alley drains, and storm drains
- Disconnect private sector inflow sources: rainleader connections, area drains, or other clean water discharges
- Study and implement storage and conveyance improvements

CSO Program - Current Status and Progress

The City of Minneapolis system is a combined system due to the known inflow at catch basin and roof leader connections, and unknown sources of Inflow and Infiltration (I & I). Progress has been made, but separation is not complete (see Figures 1 and 2).

April 9, 2013

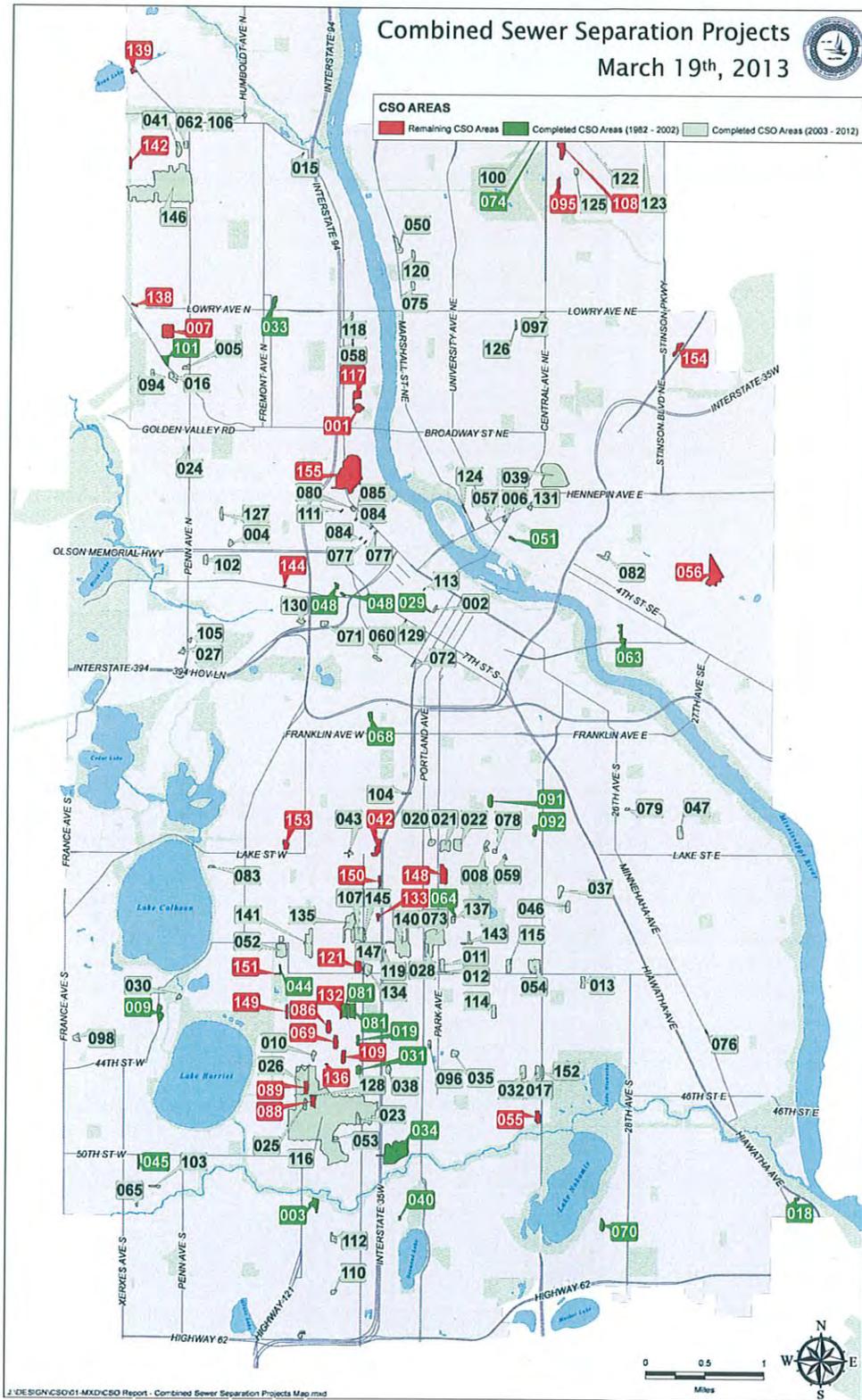


Figure 1

April 9, 2013

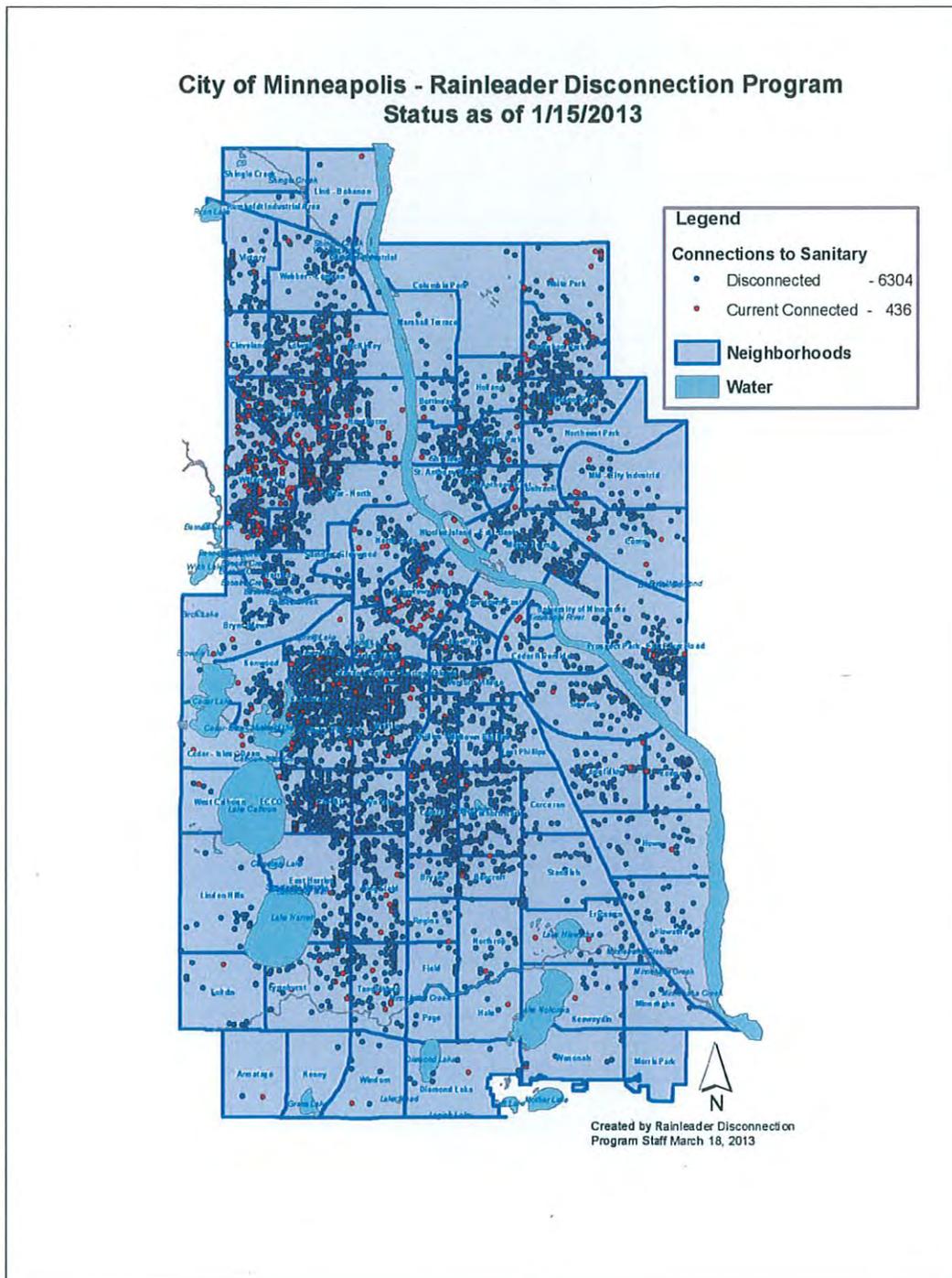


Figure 2

April 9, 2013

Progress has been dramatic throughout both Phase I and Phase II as upgrades to the system have been carried out (see Figure 3). Figure 3 indicates a very high percent capture since 1984. Frequency and volume of untreated sewage overflowing into the stormwater system during intense rainstorms and discharging into the Mississippi River have steadily diminished.

Minneapolis has had zero CSO events to the Mississippi River in five of the past six years (two very small events occurred in 2010). Although combined sewer overflows can still occur, many years of dedicated efforts by Minneapolis Public Works staff have resulted in fewer CSO events. The remaining separations are the most difficult and complex to resolve.

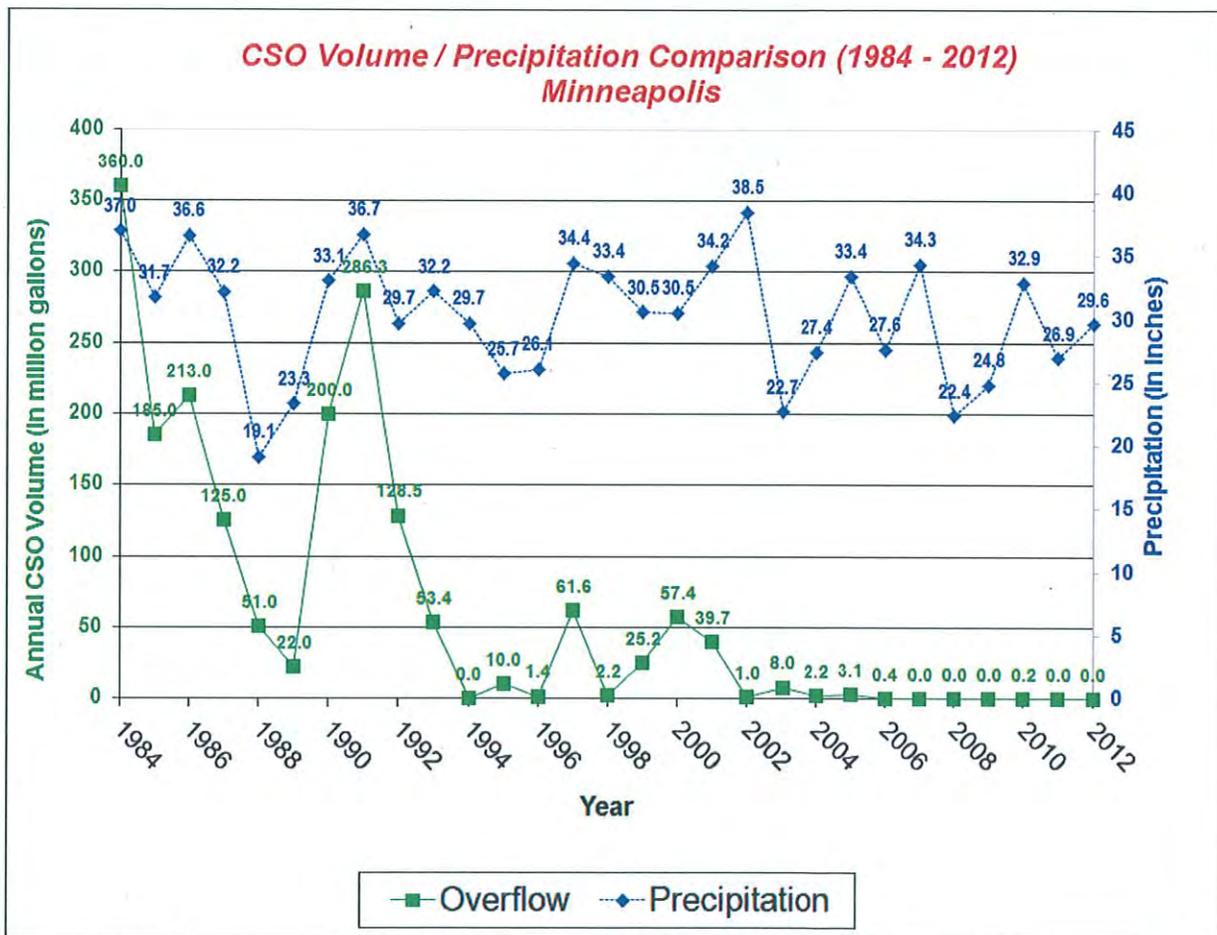


Figure 3

April 9, 2013

The following table shows information about the eight regulators remaining in Minneapolis:

Regulator Site Location	Regulator Number	Responsible Party
39 th Av S & Minnehaha Parkway	M001	MCES
38 th St E & 26 th Av S	M002	MCES
Southwest Meters	M004	MCES
Northwest Meters	M005	MCES
East Meters	M006	MCES
26 th St E & Seabury Av	M007	MCES
Oak St SE & 5 th St SE	M012	MCES
Portland Av & Washington Av S	M020	MCES

The elimination of overflow structures may not be feasible in every case without causing a public health or safety hazard. Some overflow regulators may need to remain operational for emergency relief necessitated by extreme storm or flood events, or to minimize damage due to accidents or system failures.

Since its inception in 2002, Minneapolis Combined Sewer Overflow Program, Phase II, Surface Water & Sewers Division personnel have identified, categorized, and prioritized 155 "CSO areas", meaning areas in the right-of-way with a known connection of stormwater drainage to the sanitary sewer system. The CSO Program coordinates with the Capital Improvement Project schedule to address CSO areas within the construction limits of that capital project. Occasionally, new CSO areas are discovered by City staff. This information is a result of:

- Private sewer and water connection reviews (for possible combined connections) that are done prior to issuing any new/repair permits
- Utility and plumbing inspectors' identification of CSO areas as part of their current activities
- Continued education of City staff on the importance of identifying and disconnecting CSO areas
- Flow metering and smoke testing programs

April 9, 2013

2012 Completed CSO Projects (public separation work)

PROJECT NAME	PROJECT LOCATION	ACRES
CSO #032	Alley between 16th & 17th Av S; S of E 44th S	3.1
CSO #017	Alley between Cedar & 18th Av S; North of E 45th St	2.5
CSO #130	Linden Ave W near W Lyndale Ave N	1.6
CSO #131	Vacated 7th St SE & Hennepin Ave E	1.0
CSO #143	36 th St E & 10 th Ave S	1.7
CSO #145	Nicollet Ave S & W 35th St	1.1
CSO #152	44th St E & Cedar Ave S	1.2
Total Area Removed in 2012		12.2

Minneapolis initiated a targeted metering program in 2008. One of the goals of this investigation is to identify sources of unknown Inflow and Infiltration (I & I). The 2012 target metering program included the following components:

- 1) Flow metering installation – 48 sites
- 2) While metering, the metered area is smoke tested. 68.3 miles of smoke testing was completed. Since 2007, over 186 miles have been tested.

The unknown sources of inflow have an effect on the system demonstrated by the following meter data in Figure 4. This metering data reveals an immediate reaction of increased flow in the sanitary system after a rainfall event. This meter is located on the City's system in Minneapolis on 15th Ave S and 37th St E. This is representative of inflow in a sewer shed located in South Minneapolis.

April 9, 2013

1-MN-341 Site 10X-3 - 15th Ave S & 37th St E

May 23, 2012 Rainfall Event

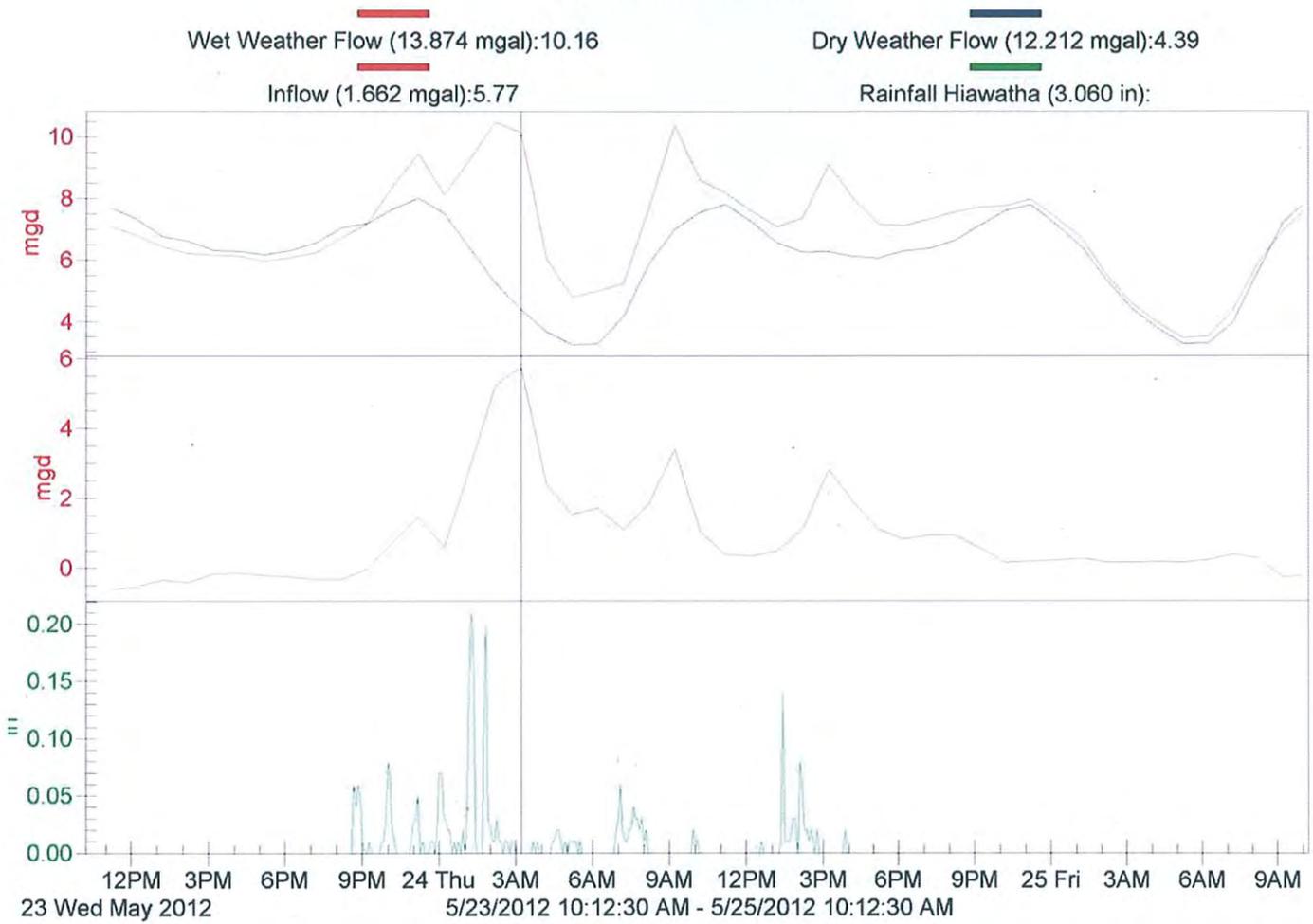


Figure 4: Meter Data

April 9, 2013

Additional CSO Program Activities

These activities directly or indirectly benefit the elimination of CSOs:

Minneapolis Flood Mitigation Program

Construction of projects from the Flood Mitigation Program has the benefit of reducing inflow and infiltration to the sanitary system.

- Construction of a new alley storm drain at Dean Parkway and Thomas Ave S to reduce or eliminate flooding in the alley which allowed water to enter the sanitary system.

Sanitary Sewer Collection System

The sanitary sewer system within the City of Minneapolis is 852 miles in length. Of those, 777.2 miles of sewers are owned and maintained by the City, while 74.8 miles are owned and maintained by MCES.

Minneapolis Public Works has a sanitary manhole cover replacement program that switches out the older seven-hole manhole covers with one-hole manhole covers. The older manhole covers allow standing water to discharge into the sanitary system during storm events. Approximately 3,632 covers have been replaced thus far, including 1,215 in 2012.

The Sewer Operations section of MPW-SWS routinely inspects sanitary infrastructure, and performs needed maintenance to ensure proper operation. Staff has divided the City into 100 areas for their sewer main cleaning program. This program is significant to the CSO program because it uncovers and reveals inflow and infiltration (I & I). Sewer mains are cleaned by many different methods, which include jetting, discing and rodding. Annual records are kept that describe the condition, as well as the cleaning that was done for that year. City staff also utilizes GIS to create maps to better track progress.

Each year, sanitary sewers are selected for cleaning on the basis of past experience, pipe size and location in relation to flood-prone areas and poor soil conditions. Some mains are cleaned annually, but occasionally additional cleanings are needed. The 10 sanitary lift stations in the City are cleaned each spring, and then checked on a regular basis to determine if additional cleaning is needed. In addition to cleaning, maintenance in 2012 also included:

- 2 major sanitary sewer repairs
- 8.1 miles of sanitary sewer lined with a cured-in-place
- 200 (requested by residents) possible sanitary backups were inspected. Of those 188 possible backups, 12 were found to be plugged & were repaired.
- 5441 problematic sanitary locations were inspected
- 82 sanitary cave-ins were addressed
- 96 minor sanitary repairs were addressed
- 347.65 miles of sanitary sewer were jetted with high pressure forced water
- 24.94 miles of sanitary sewer were rodded (cleaned)
- 53.53 miles of sanitary sewer were televised

April 9, 2013

Storm Drain Collection System

Minneapolis Sewer Operations section routinely inspects storm drain infrastructure, and performs needed maintenance to ensure proper operation. Inspection and maintenance frequency are event-driven, based on experience and inspection results history.

There are currently 145 grit chambers in Minneapolis that are inspected, cleaned and maintained by Minneapolis Sewer Operations. These grit chambers help to prevent sediment, debris and oil from entering area lakes, rivers and streams. Grit chambers inspection is based on a schedule by Minneapolis Sewer Operation personnel, and cleaned if necessary. Sediment is removed, the presence of floatables is noted, and the grit chamber cleaning dates are logged. This information is then compiled into a database and maintained by the Sewer Operations section of the Surface Water & Sewers Division.

Storm drain outfalls are inspected on a five-year schedule, generating information on:

- Condition of structures
- Significant erosion
- Any necessary repairs

Grit chamber maintenance and repairs are planned within the constraints of resources and budget, as well as the schedules of other operations. Ponds and pump stations are inspected after significant rainfall events; however, other events might require a maintenance response.

Catch basins are cleaned, removing accumulated sediment, trash and debris. This prevents pollution of receiving waters and minimizes flooding problems. Employees from the Public Works division of Street Maintenance section performs annual inspections, during which they clean catch basin grates on summer street sweeping routes, removing debris and sediment from blocked structures.

Statistics from the 2012 Storm Drain Maintenance program include:

- No major repairs to the storm drain system
- Performed 240 minor repairs to storm drain lines, catch basins or manholes
- Televised and condition assessed 80.90 miles of storm drain pipe
- Inspected 122 and cleaned 115 grit chambers. A total of 362.5 cubic yards was removed from the grit chambers and another 150 cubic yards was removed from a storm tunnel, for a total of 463.5 cubic yards that was removed and properly disposed of.
- Maintained 11 stormwater holding ponds
- Inspected 321 of 387 known storm drain outfalls. Of those 321 inspected, 3 need extensive repairs, 15 need major repairs, 60 need minor repairs/cleaning.
- Monitored and maintained 26 pump stations
- Inspected 3 miles of storm tunnels. Inspections will continue on a regular inspection cycle.
- 3.15 miles of storm drain were jetted with high pressure forced water
- 200 feet of storm drain was lined with cured-in-place-pipe (CIPP) (City Forces)

April 9, 2013

System Challenges

The City of Minneapolis has separated a significant amount of clear water out of the sanitary sewer system and is moving it to the stormwater system. The remaining sources of inflow pose both technical and financial challenges. The receiving stormwater system is at or above capacity in many locations, creating structural and operational risks with the infrastructure. Much of the receiving storm system discharges into storm tunnels. During heavy rain events, pressurization occurs, creating various problems that affect the integrity of the storm tunnels. These problems include fracturing of the tunnel liner, which in turn creates voids in the sandstone surrounding the tunnel. Some of the storm tunnel system needs a significant amount of maintenance and rehabilitation prior to adding additional stormwater. The City has identified priority needs in the storm tunnel system and is working actively to address structural deficiencies. In addition, there are discussions to identify funding sources to assist with the design and construction of a parallel I-35W South tunnel to provide the necessary capacity in that tunnel system.

There are also known areas with localized flooding. Moving additional clear water to a system that is causing the flooding exacerbates the problem. In these situations, we cannot just separate the clear water, but must also respond to the risk of property damage.

In some instances, removing additional clear water and routing instead to the storm drain system is met by additional challenges from watershed organization rules or impaired water status.

Operating and maintenance costs are also increasing as a result of sedimentation occurring in the pipes due to inadequate velocities in the combined pipe system. The sedimentation is also causing methane gas build up and increased corrosiveness in the system.

Future Improvements

The City of Minneapolis will continue to make further reasonable progress maintaining and rehabilitating the combined sewer system and the storm sewer system, and increase the performance of those systems keeping in mind the goal of being the highest performing CSO system.