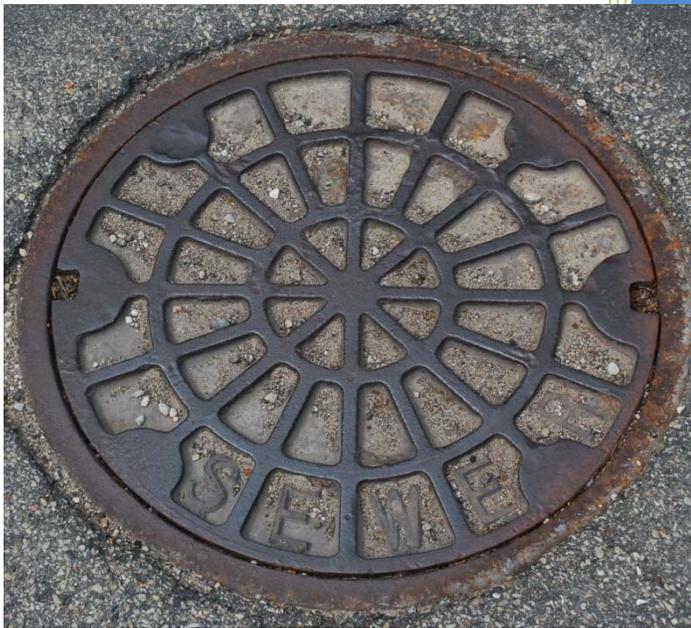


VILLAGE OF SHOREWOOD CAPACITY, MANAGEMENT, OPERATIONS, MAINTENANCE (CMOM) PLAN



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the Village of
Shorewood
AT THE EDGE OF THE CITY AND THE HEART OF EVERYTHING

**Superior
Engineering**

Version 3
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SECTION 1 - OVERVIEW

1.1 Background and Information

Located between the shores of Lake Michigan and the banks of the Milwaukee River, the Village of Shorewood was incorporated in 1900. Today, Shorewood is a community of approximately 14,000 people served by an urban infrastructure which dates to the early 1900's.

The Shorewood Sewer Utility currently operates and maintains a sewer collection system which consists of 158,400 linear feet of sanitary and combined sewers. The sanitary system, generally located west of N. Oakland Avenue, is comprised of 61,200 feet of sanitary sewer ranging in size from 8 inches to 15 inches in diameter. The combined system generally serves areas east of N. Oakland Avenue and includes approximately 97,200 feet of combined pipe ranging in size from 12 inches to 78 inches. Pipe materials in both systems include concrete, clay and brick.

The wastewater from the Village collection system discharges to the Milwaukee Metropolitan Sewer District (District) via several Metropolitan Interceptor Sewer (MIS) connections. The District is responsible for treating the wastewater

A Capacity, Management, Operations and Management (CMOM) Plan is required to comply with the Satellite Stipulation between the State of Wisconsin and the Village of Shorewood (*State of Wisconsin v. Milwaukee Metropolitan Sewerage District, et. al.* Case No. 2005-CS-000013) as well as the stipulation entered between the State of Wisconsin and the District (*Stipulation – State of Wisconsin v. Milwaukee Metropolitan Sewerage District.* Case No. 02-CS-2701). Copies of the applicable portions of the stipulations are included in Appendices A and B, respectively. The overall intent of the CMOM Plan is to reduce sanitary sewer overflows (SSOs) in accordance with the regulations.

1.2 CMOM Program Objectives

The Wisconsin Department of Natural Resources (DNR) defines a CMOM program that achieves these primary objectives:

1. Ensures that communities have adequate wastewater collection capacity.
2. Improves the operation and performance of the municipal sanitary sewer collection system.
3. Evaluates areas of excessive inflow of precipitation or groundwater into the system.
4. Conducts maintenance and repairs needed to prevent problems.
5. Reduces the frequency and occurrence of sewer overflows and basement backups.
6. Provides more effective public notification when overflows do occur.

In addition to these objectives, an effective CMOM program also:

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1. *Protects human health* including drinking water, swimming, blood-born pathogens, fishing
2. *Protects the local economy* by preventing property damage, beach closures, and enhancing the fishing industry
3. *Protect infrastructure investment* by properly maintaining the sewers to reduce emergency repairs and extend the system life

For further information on the background of a CMOM Plan and components, reference the **CMOM Strategic Plan, January 2008** located in Appendix C.

1.3 CMOM Program Components

The CMOM Plan includes the following components:

- Section 2 Management Plan
- Section 3 Operation and Maintenance (O&M) Plan
- Section 4 Capacity Plan
- Section 5 Overflow Response Plan (ORP)
- Section 6 Condition Assessment Plan
- Section 7 Communications Plan
- Section 8 Audit Plan

1.4 Definitions

For the purpose of this document the following definitions pertain:

1. **CMOM** Capacity, Management, Operations and Maintenance. A program to efficiently operate and maintain collection system assets to minimize performance failures and overflows.
2. **Collection System** is defined as the Village sanitary sewer system including sanitary sewers, combined sewers, manholes and associated equipment.
3. **Combined Sewers** is defined as sewers located in the combined sewer area. These sewers include flow from the sanitary sources as well as storm water. For purposes of this document, combined sewers may be referred to as sewers.
4. **DNR** – Wisconsin Department of Natural Resources
5. **DNR Chapter NR 110** – Register May 2001, No. 545 – Sewerage Systems “NR 110”. State of Wisconsin rules for sewerage systems.
6. **District** is the Milwaukee Metropolitan Sewerage District
7. **Infiltration** definition Wisconsin DNR Chapter NR 110 (see below for NR 110) - means water other than wastewater that enters a sewerage system (including sewer service

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connections) from the ground through such sources as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow.

8. **Inflow** definition from Wisconsin DNR Chapter NR 110 means water other than wastewater that enters a sewerage system (including sewer service connections) from sources such as roof leaders, cellar drains, yard drains, area drains, foundation drains, drains from springs and swampy areas, manhole covers, cross connections between storm sewers and sanitary sewers, catch basins, cooling towers, storm waters, surface runoff, street wash waters, or drainage. Inflow does not include, and is distinguished from, infiltration.
9. **I/I** Infiltration/Inflow abbreviation
10. **Sanitary sewer overflow (SSO)** is a condition whereby untreated sewage from the Village sanitary sewerage collection system is discharged into the environment prior to reaching treatment facilities thereby escaping wastewater treatment. It is also considered a discharge of sewerage to waters of State. When caused by rainfall it is also known as **wet weather overflow**. **SSO** is also referred to as “confirmed sewage spill”, “sewer overflow,” or “overflow”.
11. **Satellite Municipality** is a municipality that is served by the District. The Village of Shorewood is considered a satellite municipality.
12. **Stipulation.** Satellite Stipulation between the State of Wisconsin and the Village of Shorewood. See Table 1-1 for a summary of the Village requirements.
13. **Village** – Village of Shorewood

1.5 Stipulation Summary

As noted previously, the Village’s Stipulation with the State of Wisconsin is included in Appendix A. Some of the general provisions required under the Stipulation are outlined in Table 1-1.

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Table 1-1 Stipulation Summary – Village of Shorewood

Section No. ¹	Description	Deadline	Complete
General	Reduce peak flows in the combined sewers during heavy rain fall events- implement Article 3(B) of Chapter 9 of the Village Code for storm water management. Continue to implement downspout disconnection and to promote construction of rain gardens and the installation of rain barrels in the combined sewer area. [Note that this reference from the stipulation has been revised to Chapter 250].	Ongoing by Shorewood	Ongoing
17	Flow Monitoring and Rain Gauges – District	Ongoing by District	Ongoing
18	Enforcement of Sewer Use Ordinances	March 1, 2006	Annually
19	Defects 2010 Limited SSES Study	12/31/2006	Yes
20	Inspect Manholes for Ponding	9/30/2006	Yes
21	Inspect Manholes on a five year basis	6/30/2006	Annually – 20 percent
22	CMOM Plan	6/30/2009	June 24 th , 2009

Note 1 – Section No. refers the Stipulation paragraph number.

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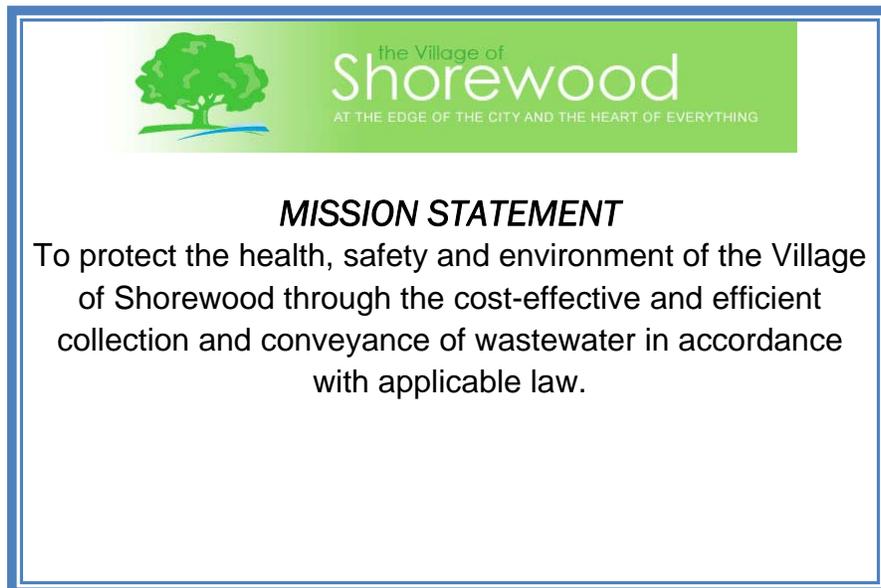
2.1. Background and Information

A Management Plan describes the approach that the Village is undertaking to implement their CMOM Plan. The Management Plan consists of the following components:

1. Mission Statement
2. Goals
3. Organization
4. Management of Assets
5. Customer Service
6. Legal Authority
7. Fiscal
8. Data Management
9. Standard Design, Construction and Inspection
10. Training
11. Performance Measurements

2.2. Mission Statement

The Village of Shorewood developed a mission statement for their CMOM Program.



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2.3. Goals

The goals outlined below contribute to the overall mission and address issues of health and safety, cost-efficient operation and compliance with applicable law. Please note that the goals in BOLD are required by District. See Table 2-5 linking goals with performance measures. .

1. **COMPLY WITH WPDES permit**
2. Minimize the occurrence of problematic overflows
3. **Improve or maintain system reliability**
4. Maintain assets cost-effectively through a rehabilitation and replacement program based on condition assessment
5. Provide first-class customer service
6. **Reduce the potential threat to human health from sewer overflows**
7. **Provide adequate capacity to convey peak flows**
8. **Manage I/I**
9. Protect collection system worker health and safety
10. **Operate a continuous CMOM Program**
11. Maintain annual cleaning and inspection programs
12. Continue cost-efficient operation of the sewer utility

2.4. Organization Structure

The Village owns and operates the wastewater collection system. The Shorewood Utility Staff includes six full-time employees who divide their time between operation and maintenance of the sewer collection system and the Shorewood Water Works. The Village's Director of Public Works and the Director of Operations allocate significant time to the management of the Utilities.

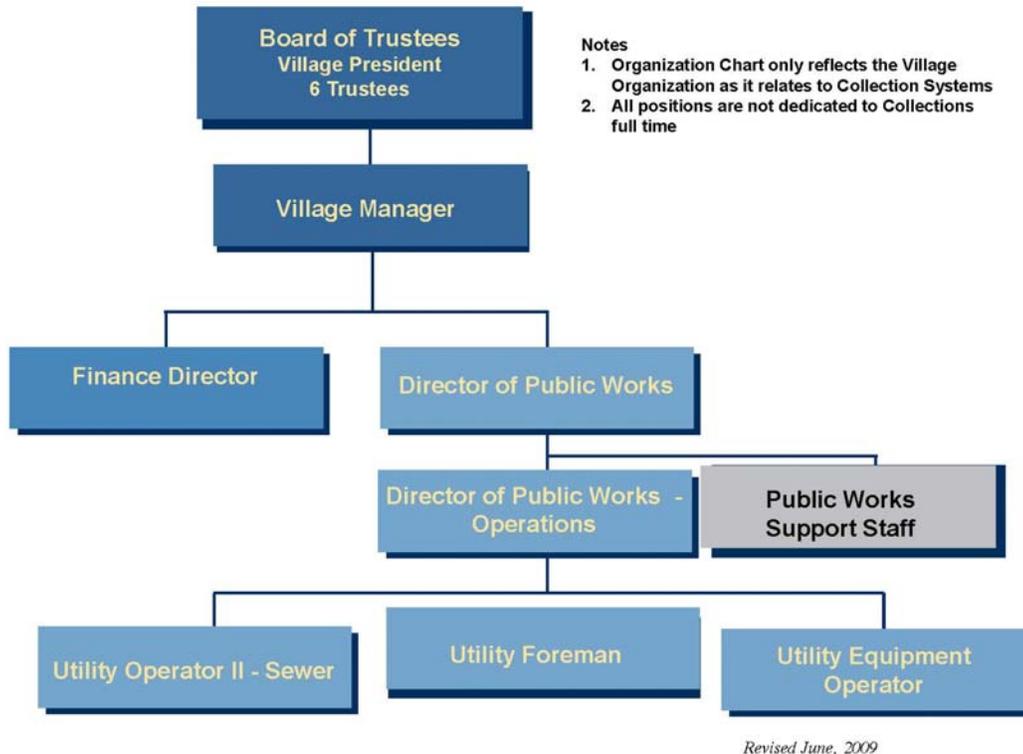
The Village reviews staffing and service out-sourcing opportunities on a regular basis. This evaluation will continue throughout the administration of the CMOM Program. See Table 2-1 for Village staff responsibilities and Figure 2-1 for the Village organization chart as it relates to the collection system.

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Table 2-1 Village Staff Responsibilities	
Title	Responsibilities
Village Board of Trustees	Elected officials who serve a policy-making role for the Village.
Village Manager	Reports to the Village Board of trustees and manages all personnel, procurement, budget and overall operation of Village activities including the collection system.
Director of Public Works	Responsible for implementing and monitoring the CMOM Program. Is also responsible for the Collection Systems and all other functions of the DPW.
Director of Public Works – Operations	Responsible for sewer crews and programs.
Utility Foreman	Responsible for implementing sewers and manhole inspections; sewer cleaning; sewer repairs; and rehabilitation recommendations
Utility Operator II – Sewer	Performs cleaning and sewer and manhole inspections.
Equipment Operator	Performs minor sewer repairs.

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Figure 2-1
Village of Shorewood Organization Chart 2009 - Collection Systems



2.5. Management of Assets

The cost-effective management of assets is a critical CMOM program goal.

- 2.5.1. The Village currently uses paper forms to track all activities. An example of each form can be found in Appendix E. The Village reviews and updates these forms on a regular basis.
- 2.5.2. Sewer Maps. The Village has updated their sanitary sewer map showing key assets including sewers and manholes. In addition, the Village maintains a sewer rehabilitation map identifying assets that were inspected and rehabilitated.
- 2.5.3. Operation and Maintenance Programs – See Section 3 for more details.

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- 2.5.4. Condition Assessment Program. The Village currently has a program to evaluate on a routine basis the condition of the collection system assets. This assessment is used to budget and plan for upcoming rehabilitation and replacement programs. See Section 6 for more details.
- 2.5.5. Equipment and Spare Parts. To perform routine operations and maintenance, respond to emergencies and prevent sanitary sewer overflows, it is critical to have adequate equipment. In addition, spare parts for certain equipment items have been identified for emergencies. A list of equipment and spare parts that the Village owns and maintains can be found in Table 2-2.

Table 2-2 Village of Shorewood Equipment and Spare Parts				
Description	Model	Qty	Capacity	Year Purchased
Sewer Jetter/Combination	Camel 200-series 0335-1326	1	10 Yard..	2004
TV Truck Shared with Brown Deer and Mequon	Ford Truck with Aries Camera System	1	1,000 feet of cable	
Portable Pump	Honda GX240	2	8 HP, 3" discharge 320 gpm	
Portable Pump	CH & E	1	5 HP, 3" 67 gpm	
Portable Generator	Honda	1	3500 Watt	

- 2.5.6. Critical structures in the collection system have been identified. These are outlined in Table 2-3.

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Table 2-3 Critical Infrastructure – Village Of Shorewood		
Description	Location	Manhole
Overflow Manhole (valved – to storm sewer)	Larkin & Glendale	277
Overflow Manhole (valved – to storm sewer)	Morris & Glendale	279
Overflow Manhole (valved – to storm sewer)	Woodburn & Glendale	284
Overflow Manhole (valved – to storm sewer)	Wildwood & Glendale	286
Oakland Avenue Sewer	Edgewood to Kensington	
Capital Drive Sewer	River to Lake Michigan	
Lake Drive Sewer	Edgewood to Kensington	
Wilson Drive Sewer	Capital to Glendale	
Vault - Edgewood Street and Maryland Avenue	Shorewood Vault – flow from City of Milwaukee is coming in and discharges to the District Sewer.	
Sewer - Sherbourn West side of Bike Path	Capital Drive on Estabrook Parkway	

2.6. Customer Service

Service delivery is key for an effective CMOM program. The program is monitored, in part, based on the time necessary for response to and resolution of a problem. Tracking these issues provides valuable information related to system functionality, including identification of laterals (customer obligation) versus mainline (Village) issues. The Village has a form to document customer calls and is using this as a tool to address problem areas and ensure that all work is documented. A copy of this form can be found in Appendix E.

The Village website is used to inform Utility customers of upcoming projects and provides access to current ordinances, newsletters and staff contact information.

See Section 7 Communication Plan for other details related to communications.

2.7. Legal Authority

Legal authority consists of the Village codes and ordinances and the enforcement of codes and ordinances. The Village reviews and updates their ordinances on a regular basis. All ordinances are available on the Village website. The Village currently has the following ordinances:

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- 2.7.1. Village Of Shorewood Sanitary Sewer Use Regulations And Charges. Chapter 514 Article Xii, §514-44-§514-50
- 2.7.1.1. Sewer Use Ordinance – The regulation regulates the use of public and private sewers and drains in to the public sewerage system within the Village.
 - 2.7.1.2. The regulation requires individual property owners to maintain sewer service from the street main to the property and to prevent unnecessary overburdening of the sewer system. Village has the legal authority to require homeowners to comply with the regulation.
 - 2.7.1.3. The Village is committed to enforcing their ordinance to ensure that clear water is not entering the system.
 - 2.7.1.4. The Village will review applicable ordinances on a regular basis to provide the necessary enforcement tools to ensure that significant clear water from other sources is not entering the collection system.
- 2.7.2. Village Plumbing Standards Chapter 415. Chapter §415-20 –Construction and maintenance of water and sewer laterals. Requires the property owner to maintain their sewer lateral at their own cost.
- 2.7.2.1. Village Plumbing Standards Chapter 415. Chapter §415-13 Fats Oil and Grease (FOG).
 - 2.7.2.2. Fats, oil and grease coat, congeal, and accumulate in pipes, leading to costly and hazardous flow of grease into laterals, sewers, entering the collection system can accumulate on sewer pipe walls causing blockages and foul odors in the sewer system. Fat, oil and grease in the sewers is typically from improper management of grease traps in food establishments such as restaurants, schools, and coffee shops.
 - 2.7.2.3. Grease traps or separators must be properly maintained and cleaned on a regular basis to properly remove grease. The food establishment needs to document the maintenance and cleaning.
 - 2.7.2.4. The Village Ordinance Chapter §415-13 on Grease Separators currently addresses the inspection of the grease traps. The enforcement of the Village Ordinance is currently handled by the Shorewood Health Department and the Village Plumbing Inspector. In addition, the Health Department can request grease traps in food establishments to be installed.

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2.7.3. The Village is committed to enforcing ordinances to ensure that clear water is not entering the system and to prevent illegal discharges into the collection system.

2.7.4. The Village also complies with the following:

- District rules and regulations
- The State plumbing code - Wisconsin Administration Code chapter COMM. 82.
- DNR requirements.

2.8. Fiscal programs

The Village currently charges a sewer fee based on water consumption and has raised sewer rates as necessary to fund the operation and maintenance and capital improvements in the collection system. This rate is reviewed annually. The Village also uses the following factors to review rates:

- O&M Programs - see Section 3.
- Condition Assessment Programs - see Section 6.
- Recommendations to reduce I/I.
- Capital Projects

2.9. Data Management

2.9.1. The Village has a GIS system in place. This system is utilized and updated on a continual basis.

2.9.2. The Village currently uses paper forms to track all maintenance activities including inspection, cleaning, rehabilitation and replacement projects. An example of the forms used can be found in Appendix E. The Village reviews and updates these forms on a regular basis.

2.10. Standard Design, Construction, and inspection

2.10.1. The Village utilizes the services of an engineering consultant for the development and design of sewer system improvements. Standard specification for sewer and water construction in Wisconsin, latest edition is used.

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2.11. Training and Education

- 2.11.1. Safety. The Village uses a consultant to provide safety training on a regular basis.
- 2.11.2. Equipment and Tools. The Village uses vendors and equipment manufactures for training.
- 2.11.3. Professional Training. The Village budgets for and strongly encourages employees to attend local training for collection system proficiencies.

2.12. Performance Measurements

- 2.12.1. The Village has various performance measures that are monitored on a regular basis. These measurements are found in Table 2-4 and Table G-1
- 2.12.2. These performance measures are based on the following:
- The Stipulation
 - District Rules
 - DNR Requirements
 - Village Goals
- 2.12.3. An annual review of the performance measures will be completed to evaluate accomplishments and areas for improvement. See Section 8 – Audit Plan for more details.

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Table 2-4 Village of Shorewood Performance Measures			
DESCRIPTION	GOALS**		
SEWERS			
Total Sewer Length in Feet	158,400 feet		
Sewers cleaned (Feet/year – ft/yr)	20%	31,000	ft/yr
Sewers inspected	14%	22,629	ft/yr
Sewer Failures/year – Number/Size and Length of Sewer		0	each
MANHOLES (MH)			
Number of Manholes in System	1062 Manholes		
Manholes inspected	20%	213	MH/yr
REHABILITATION/REPLACEMENT DESCRIPTION			
Numbers of manholes repaired		TBD	MH
Number of manholes replaced		TBD	MH
Sewer Rehabilitated (Lined, Grout, Point Repair)		TBD	feet
Sewer Replaced		TBD	feet
MAINTENANCE ACTIVITIES			
Root Removal		TBD	feet
Smoke Testing		TBD	%
Dye Water Flooding		TBD	%
Flow Monitoring percent of the collection system		TBD	%
TRAINING – Wisconsin Administrative Code Comm 32			
STIPULATION			
Compliance with Tributaries Stipulation (in Appendix B) - See Note 1			
REPORTING			
Number of basement backups from Village sewers		0	
Number of basement backups from Private property laterals		0	
Total number of backups		0	
Number of Sanitary Sewer Overflows		0	
<p>** See Recommended Annual Performance Measures in Appendix G Table G-1</p> <p>Note 1 The Village of Shorewood "agree[s] that they will encourage and support MMSD's continuing development, implementation, and management of flow monitoring and rain gauge systems and peak flow performance standards" The Village "retains all legal rights to object to</p>			

SECTION 2 – MANAGEMENT PLAN

and appeal any rules and standards implementing such MMSD activities."

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SECTION 3 – OPERATION AND MAINTENANCE PLANS

Table 2-5 CMOM Program Goals, Objectives, Regulatory Expectations and Performance Measures

Program Goals	Objectives	Regulatory Expectations	Performance Measures (PMs)
1. Comply with the WPDES permit concerning sanitary sewer overflows	Ensure procedures are in place to identify SSOs, report SSOs to the WDNR, and mitigate impacts from the SSOs per the WPDES permit.	Untreated wastewater discharges from the system are a violation of the WPDES permit.	Number of Sanitary Sewer Overflows
2. Minimize the occurrence of problematic overflows	Ensure procedures are in place including O&M practices to minimize overflows	The WDNR General Permit for SSOs provides specific circumstances under which the WDNR may not take enforcement action against the discharger. These circumstances include situations where the SSO occurred to prevent loss of life, personal injury, or severe property damage.	<p>Inspect sewers, manholes and lift stations</p> <p>Rehabilitate or replace sewers and manholes</p> <p>Perform maintenance activities</p>

SECTION 3 – OPERATION AND MAINTENANCE PLANS

Table 2-5 CMOM Program Goals, Objectives, Regulatory Expectations and Performance Measures

Program Goals	Objectives	Regulatory Expectations	Performance Measures (PMs)
3. Maintain assets cost effectively	<p>Ensure preventive maintenance is performed (pump stations, manholes, and sewer pipes)</p> <p>Continue to conduct condition assessments on sewer assets.</p>	State statutes require wastewater rates to include a component for equipment replacement.	<p>Inspect sewers and manholes</p> <p>Rehabilitate sewers and manholes</p>
4. Provide first class customer service	Ensure Customer Service program is meeting the Village needs		Number of customer complaints
5. Improve or maintain system reliability	Confirm the existence of any system components that do not function according to established reliability standards.		<p>Inspect Sewers and Manholes</p> <p>Rehabilitate sewers and manholes</p> <p>Perform maintenance activities</p>

SECTION 3 – OPERATION AND MAINTENANCE PLANS

Table 2-5 CMOM Program Goals, Objectives, Regulatory Expectations and Performance Measures

Program Goals	Objectives	Regulatory Expectations	Performance Measures (PMs)
6. Reduce the potential threat to human health from sewer overflows	Identify potential overflows <ul style="list-style-type: none"> • Confirm the existence of locations where system overflows could pose a threat to human health. • If such locations exist, develop response measures and investigate alternatives for eliminating the potential threat. 	Overflows from the system are a violation of the WPDES permit, Clean Water Act, and Wisconsin State law.	Reporting PMs Inspect, replace and rehabilitate sewers and manholes
7. Provide adequate capacity to convey peak flow	Gain an understanding of the current system's ability to convey peak flows and what steps are necessary to address system inadequacies.	The State would require a System Evaluation/Capacity Assurance Plan for the Village if the evidence shows that the system does not possess the capacity to convey peak flows .	Perform flow monitoring as necessary Rehabilitate and replace sewers and manholes

SECTION 3 – OPERATION AND MAINTENANCE PLANS

Table 2-5 CMOM Program Goals, Objectives, Regulatory Expectations and Performance Measures

Program Goals	Objectives	Regulatory Expectations	Performance Measures (PMs)
8. Manage infiltration and inflow	<p>Reduce I/I</p> <ul style="list-style-type: none"> • Understand the current level of I/I in the system, the extent to which it poses a threat to the regional or municipal system operation, sources of I/I, and potential remedial measures. • Establish a program to reduce I/I in situations where I/I results in service problems, overflows and building sewer backups. Such performance standards may include those that would prevent I/I from increasing in the future. 	<p>If the State or MMSD determines a SECAP is required of the Village, a component of this plan will include I/I evaluation and reduction.</p>	<p>Inspect sewers and manholes</p> <p>Rehabilitate sewers and manholes</p> <p>Perform maintenance activities</p>
9. Protect collection system worker health and safety	<p>Provide a safe working environment for all employees.</p>		<p>Compliance with WI Administrative Code Comm 32</p>

SECTION 3 – OPERATION AND MAINTENANCE PLANS

Table 2-5 CMOM Program Goals, Objectives, Regulatory Expectations and Performance Measures

Program Goals	Objectives	Regulatory Expectations	Performance Measures (PMs)
10. Operate a continuous CMOM Program	Establish procedures for monitoring CMOM Program implementation and initiating program modifications.		Update Plan Yearly Report per Table 8-1
11. Maintain annual cleaning and inspection programs	Provide a continuous program to maintain the assets	Prevent SSOs through cleaning	Meet cleaning and inspection PMs
12. Continue cost-efficient operation of the sewer utility	Adequate funding to support the initiatives		Inspection, cleaning and rehabilitation of sewers and manholes

SECTION 3 – OPERATION AND MAINTENANCE PLANS

3.1 Background and Information

Operation and Maintenance (O&M) Programs for the collection system are critical to properly operate and maintain the collection system and to provide recommendations for future rehabilitation and replacement projects. The Village has historically inspected and cleaned sewers and manholes on a routine basis. These inspection programs are necessary to determine structural integrity, root problems, illegal connections, and I/I problems. In addition, several other programs are used on an as-needed basis to maintain the system.

The Village has the following O&M Programs:

1. Inspection of Sewers
2. Inspection of Manholes
3. Combined Sewer Area Programs
4. Inspection of Easements
5. Inspection of Critical Structures
6. Code Compliance
7. Sewer Cleaning
8. Smoke Testing
9. Dye Water Flooding
10. Root Control

3.2 Inspection - Sewers

- 3.2.1 The sewer inspection cycle will be performed initially on seven year cycle. The Village currently does the inspections by Village staff. The Village is also investigating contracting out a portion of these inspections.
- 3.2.2 Annually sewers are identified to be inspected. Based on the results of these inspections, the inspection cycle may be revised and future inspections could result in some areas inspected more frequently or less frequently than other areas.
- 3.2.3 Sewer inspections are done by using a closed circuit television camera (CCTV).
- 3.2.4 All sewer inspections are documented a copy of the form used can be found in Appendix E.
- 3.2.5 The Village uses an internal evaluation document (Sanitary Sewer Report) for assessments.

SECTION 3 – OPERATION AND MAINTENANCE PLANS

- 3.2.6 Sewer inspections will be used for condition assessment of the sewer. See Section 6 for details. Based on the condition assessment, recommendations are made for future inspections, repairs, rehabilitation or replacement for the collection system. Where possible, these improvements are scheduled in conjunction with planned roadway or other utility improvements or upgrades.
- 3.2.7 The Village does not currently have a defined program for sewer lateral inspections. Staff will continue evaluation of the development of a program to address private property lateral maintenance.

3.3 Inspection - Manholes

- 3.3.1 The Village of Shorewood inspects manholes on a regular basis. **Per the Stipulation, manholes are required to be inspected once every five years or 20 percent per year.**
- 3.3.2 Manhole inspections shall be documented a copy of the form used can be found in Appendix E.
- 3.3.3 Manhole inspections will be used for condition assessment of the manhole. All defects shall be replaced within 18 months in accordance with the Stipulation.
- 3.3.4 Based on the condition assessment, a recommendation shall be made for future inspections, rehabilitation or replacement. See Section 6 for Condition Assessment information.

3.4 Combined Sewer Area Programs

- 3.4.1 Combined sewers are inspected on the same cycle as the sanitary sewers.
- 3.4.2 The Village conducted several pilot project programs in the combined sewer area with the objective of reducing the rainfall entering the combined sewers. An extensive program developed in partnership with MMSD was recently completed which included downspout disconnections and construction of rain gardens. The Village continues to promote these programs to reduce clear water into the sewer system.

3.5 Inspection of Easements

- 3.5.1 The Village currently has 250 feet of 8-inch sewer located on easements or private property. It is important to keep these areas clear to ensure that access to all manholes is available for maintenance activities and emergencies.

SECTION 3 – OPERATION AND MAINTENANCE PLANS

3.5.2 There is an on-going inspection program to ensure sewers and manholes are accessible.

3.6 Inspection of Critical Structures

3.6.1 The Village also performs other inspections for critical points in the system as necessary. These can and will vary upon the situation. Critical points are identified in Table 2-3.

3.7 Code Compliance

3.7.1 Properties are inspected for compliance with the ordinances and codes. The Village is committed to enforcing codes.

3.8 Sewer Cleaning Program

3.8.1 The Village currently executes employs a sewer cleaning program to remove debris from the sewers and to prevent blockages and potential sewer backups or SSOs. A copy of the form can be found in Appendix E.

3.8.2 The sewer cleaning cycle will be performed initially on a five year cycle. Sewers are identified to be cleaned on an annual basis. Based on the results of these inspections, the inspection cycle may be revised and future inspections could result in some areas inspected more frequently or less frequently than other areas.

3.8.3 Other areas that may require more frequent cleaning are included in the cleaning schedule.

3.9 Smoke Testing Program

3.9.1 Smoke testing is another element that the Village uses to identify sources of I/I and potential defects.

3.9.2 On a regular basis, this will be reviewed to determine if smoke testing is recommended.

3.9.3 Smoke Testing Procedure

3.9.3.1 Notify the Shorewood Police Department, North Shore Fire Department and area residents when performing smoke testing. (See Appendix G for the letter submitted to notify residents.)

SECTION 3 – OPERATION AND MAINTENANCE PLANS

3.9.3.2 This testing is not to be performed when the ground is frozen and it prevents the smoke from penetrating the soil and identifying leaks.

3.9.3.3 Typically smoke testing will be contracted out due to the resources and equipment necessary to successfully perform this task.

3.10 Dye Water Flooding

3.10.1 Dye Water Flooding is another element that the Village uses to identify sources of I/I.

3.10.2 Dye Water will be used on an as-needed basis.

3.10.3 Dye Water Flooding Guidelines

3.10.3.4 Notify the Shorewood Police Department, North Shore Fire Department, area residents and the DNR prior to doing dye water flooding to let them know that the water will be colored in the event that it reaches navigable waters.

3.10.3.5 This testing should not to be performed when the ground is frozen and it prevents the water from penetrating the soil and identifying leak

3.10.3.6 Typically dye water flooding will be contracted out due to the resources and equipment necessary to successfully perform this task.

3.11 Root Control

3.11.1 Root intrusion in collection systems is another source of blockages and overflows. Control of roots will be done in combination with routine cleaning to reduce blockages and overflow.

3.11.2 Root Control will be done on an as-needed basis.

SECTION 4 – CAPACITY PLAN

4.1 Background and Information

The Village is required to have sufficient capacity during dry weather events and to manage peak wet weather flows. This includes identifying areas during wet weather events where excess flow from I/I occurs.

4.2 Capacity

- 4.2.1 Dry Weather Conditions. The Village has no dry weather capacity restrictions.
- 4.2.2 Wet Weather Conditions. The Village will continue to reviews flows during wet weather events to reduce I/I. Problems during wet weather events and SSOs are analyzed to determine the root cause of these problems. A root cause failure analysis form is included in Appendix E.
- 4.2.3 The Village has an on-going inspection program to identify I/I.
- 4.2.4 The Village is enforcing their ordinances on a continuous basis to ensure that I/I is reduced.

4.3 Field Investigation

- 4.3.1 The Village performs field investigations on a regular basis to identify I/I, defects and other potential problems. All problems are based on: customer service requests, staff recommendations or as needed.
- 4.3.2 Problem areas and overflows are investigated. Overflows are reported – See Section 5 Overflow Response Plan for details.
- 4.3.3 Observations and recommendations from these field investigations are used to enhance the O&M programs and to provide repair, rehabilitation and replacement recommendations.

4.4 Flow Modeling

- 4.4.1 The Village currently does not use flow modeling to evaluate the collection system.
- 4.4.2 Flow modeling may be considered if the Village determines that it is necessary to manage peak wet weather flows.

SECTION 4 – CAPACITY PLAN

4.5 Flow Monitoring

- 4.5.1 The Village will use the District flow monitors to evaluate flows in the system and to evaluate capacity constraints.
- 4.5.2 Additional flow monitoring may be done on a case-by-case basis to identify high I/I areas and to confirm flows in the system.

4.6 I/I Reduction

- 4.6.1 The Village has an ordinance for property owners to maintain their service connection or lateral. The Village will continue to enforce this ordinance –
- 4.6.2 The Village completed a downspout disconnection program in the combined sewer area. Shorewood will continue to promote downspout disconnections and the installation of rain gardens and rain barrels throughout the Village.
- 4.6.3 The Village will continue to review alternative programs to eliminate clear water in the sanitary sewer and combined sewer systems.
- 4.6.4 Village properties were primarily constructed with building foundation drains connected to the sanitary sewer or combined sewer. Current plumbing code regulations require building foundations to be connected to a sump pump or storm sewer, however existing properties were not required to update the plumbing.
- 4.6.5 Rehabilitation and replacement programs are based on reducing I/I in addition to ensuring that the structural integrity of the assets is maintained.
- 4.6.6 Projects are included in the Village Capital Improvement Program for planning and financing purposes.

4.7 Peak Flow Performance Standards

Pursuant to the Stipulation between the State of Wisconsin and the Satellite Municipalities, the Village “agree[s] that [it] will encourage and support MMSD’s continuing development, implementation, and management of flow monitoring and rain gauge systems and peak flow performance standards.” The Village “retains all legal rights to object to and appeal any rules and standards implementing such MMSD Activities.” Refer to Table 2-5 and Appendix G-1 for additional information.

SECTION 5 –OVERFLOW RESPONSE PLAN

5.1 Background and Information

An Overflow Response Plan (ORP) is necessary to protect public health and the environment. It provides procedures to respond to overflows, documents work and reports notification to the appropriate parties. The ORP is a standard operating procedure (SOP) and the SOP is included in Appendix D. A summary of the Plan is included in this section.

5.2 Procedure

The Village has procedures that are updated on a regular basis and are included in Appendix C Standard Operating Procedures. These procedures include:

- **Overflow Response Plan (ORP).** The Village has a standard operating procedure (SOP) to respond to Sanitary Sewer Overflows (SSOs).
- Procedures to address to investigate overflows at specific sites.
- Notify stake-holders of an overflow.
- Root cause analysis – investigate and eliminate sewer blockages. See Root Cause Failure Analysis Form in Appendix E.

5.3 Overflow Structures

- 5.3.1 There are four gravity sewer overflow points in the Village system as identified in Table 2-3 Critical Structures.
- 5.3.2 As part of the implementation of the CMOM Plan, SOPs are developed to address these overflow points. See Standard Operating Procedures in Appendix F.
- 5.3.3 In the event of an overflow or an emergency (blocked sewer, collapse, backup, etc.) SOPs should be followed.

5.4 Notification

In the event of an overflow, the Village needs to submit notification to various stakeholders. See emergency contact list in the ORP. These are as follows:

1. Notify Village Manager.
2. Verbal or email notification to the DNR within 24 hours notification that an overflow occurred.
3. Written overflow report to the DNR within five (5) days. The form can be found on the DNR website and is included in the Appendix E.
4. Email to the Water Supply Utilities that are impacted by the overflow. These notifications are found in the ORP. See Table D-2 in the ORP for notification contacts.

SECTION 5 –OVERFLOW RESPONSE PLAN

5.5 Weather Forecast

The Village also uses weather forecasting of wet weather and melting snow events to assist in predicating high flows and potential problems in the collection system. .

- TMJ 4 – news station <http://weather.todaystmj4.com>
- Weather underground web site
<http://www.wunderground.com/cgi-bin/findweather/getForecast?query=53211>.
- District <http://v3.mmsd.com/StormUpdate.aspx>.

5.6 Root Cause Failure Analysis

5.6.1 All overflows are investigated to determine what caused the overflow.

5.6.2 Other problems in the system, such as blockages or basement backups, are also investigated to determine the cause.

5.6.3 See Root Cause Analysis Form in Appendix E.

5.7 References

5.7.1 See Overflow Response Plan SOP in Appendix D for more details.

5.7.2 See SOPs in Appendix F for more details for the following:

- Wet Weather SOP

5.7.3 Root Cause Failure Analysis Form in Appendix E

SECTION 6 – CONDITION ASSESSMENT

6.1 Background and Information

A Condition Assessment Program involves documentation and inspection of the collection system to assess the condition of the infrastructure. The information gathered during the assessment is used to plan and budget for repair, rehabilitation and replacement of the assets. Recommendations for additional inspection and cleaning are made from these assessments. Listed below are several key elements that are part of the Condition Assessment Program.

6.2 Condition Assessment Key Elements

- 6.2.1 The tools listed in Section 3 - Operation and Maintenance Plans will be used for condition assessment. See Section 3 for more details. These tools include but are not limited to inspection, cleaning, smoke testing, dye water flooding and root control.
- 6.2.2 Document inspections from sewers and manholes.
- 6.2.3 Data from the inspections is reviewed and evaluated by an experienced person. The condition of the sewers and manholes is assessed and rated via the assessment code. The assessment code used is the Pipeline Assessment and Certification Program (PACP) as provided through the National Association of Sewer Service Companies (NASSCO). Sewer inspections are currently performed by the Village.
- 6.2.4 Based on the condition assessment rating, recommendations are made on an on-going basis to repair, rehabilitate, and replace to properly maintain the assets.
- 6.2.5 Analysis of system performance, maintenance history, age materials and structural risk analysis is also used to help prioritize recommendations.

6.3 Condition Assessment Recommendations

- 6.3.1 Recommendations to repair, replace and, rehabilitate the assets are based on the results of the condition assessment.
- 6.3.2 Depending upon the severity of the condition, the recommendations shall be performed by staff or contracted out to a consulting firm.
- 6.3.3 Solutions for repair and rehabilitate will depend up on the condition of the asset, the effectiveness of reducing I/I, and using the appropriate technology for the problem.
- 6.3.4 Recommendations will be used for O&M budgets and CIP.

SECTION 7 COMMUNICATION PLAN

7.1 Background and Information

The Village of Shorewood communicates with the DNR, District, the Village Board and their customers on a regular basis. The Village is governed by a Village President and 6 Village Trustees as outlined in the Village Organization Chart in Figure 2-1.

7.2 Methods of Communication

The Shorewood Village Board of Trustees meets on a twice monthly basis to determine policy issues related to finance, personnel, operations, SSO reduction and elimination, sanitary sewer system improvements and other Village business. Any SSO events or other capacity issues are presented and discussed at the Board meetings.

Currently, the Village utilizes its web-site www.villageofshorewood.org and the Shorewood Today magazine to update residents on matters related to the sewer collection system.

7.3 CMOM Communication

CMOM-related topics identified for future and/or continued discussion include:

1. Financial Impact to the Village. (Adequate budget to support initiatives including, but not limited to: capital improvements, operation and maintenance activities, personnel and equipment).
2. Problem areas in the system.
3. Sanitary Sewer Overflows.
4. Communication to stakeholders.
5. Meeting the CMOM goals
6. Cost effective reduction of I/I

7.4 Reporting Methods

As part of the Communications Plan, the Village has reporting requirements to other entities as listed in Table 8-1 and as outlined in the Overflow Response Plan (Appendix D) In addition, an annual Communication Plan as required by the District will be submitted including the component items listed above and in the District rules. The plan will include an update on meeting the performance measures.

7.5 Reference

- 7.5.1 Table 8-1 Audit and Reporting Schedule
- 7.5.2 Overflow Response Plan – Appendix D

SECTION 8 CMOM AUDIT

8.1 Background and Information

A CMOM audit is necessary to ensure that the Plan is properly implemented, goals and objectives are met, and performance measures are reviewed, evaluated, and updated on a regular basis.

The CMOM Plan provides the framework and documentation to implement the programs that the Village is currently doing. This Plan is meant to be a working document and will be updated as needed.

As part of the Audit the following will be done:

1. Audit and review the CMOM Plan
2. Monitor the Plan
3. Provide recommendations
4. Update the CMOM Plan

8.2 Audit and Review the Plan

8.2.1 Audits shall be done every five years in accordance with the Stipulation. See Table 8-1 for reporting requirements.

8.2.2 Review the Plan for the following:

8.2.2.1 Goals are applicable to the Village

8.2.2.2 Goals and strategies are applicable and meet the Stipulation, DNR and District requirements.

8.2.2.3 Program elements are applicable and relevant

8.2.2.4 Performance measures are being met. See Table 2-4 and Table G-1 for performance measures.

8.2.2.5 Budget is adequate to meet the recommendations from the various CMOM components.

8.3 Monitor the Plan

8.3.1 Monitor the implementation and measure the effectiveness of the program through performance measures.

8.3.2 Annually, review goals and performance measures to measure the program effectiveness.

SECTION 8 CMOM AUDIT

8.3.3 Submit reports as required by DNR and the District.

8.4 Provide Recommendations

8.4.1 Provide recommendations to revise the performance measures.

8.4.2 Provide recommendation to update the Plan.

8.5 Update the CMOM Plan

8.5.1 Update the CMOM Plan based on the audit, feedback from employees and recommendations.

8.5.2 The audit and the CMOM Plan update will be documented as shown in Tables 8-2, 8-3 and 8-4.

EXHIBIT 8-1 AUDIT & REPORTING SCHEDULE						
DESCRIPTION	2009	2010	2011	2012	2013	2014
AUDIT						
Develop goals and performance measures	X	X	X	X	X	X
Review actual goals and performance measures	X	X	X	X	X	X
Review and update budget and rates	X	X	X	X	X	X
CMOM Audit						X
REPORTING SCHEDULE						
District – I/I Report March 1 st	X	X	X	X	X	X
District – Chapter 13 Storm April 30 th	X	X	X	X	X	X
District – Communications Plan t	X	X	X	X	X	X
DNR – CMAR Report June 30 th	X	X	X	X	X	X
WNDR – NR 216 Report – March 31 st MS4 Permit	X	X	X	X	X	X
Clean water funding reporting requirements as necessary.						
Sanitary Sewer Overflow Notification – See Overflow Response Plan in Appendix D.						

AUDIT PLAN

Table 8-3						
Audit and Plan Update Documentation Table						
Audit Completed By:	Audit Date:	CMOM Plan Updated By:	Plan Updated Date	Approved By:	Date Approved	Update Number
						1

AUDIT PLAN

Table 8-4			
CMOM Plan Distribution List			
MANUAL NO.	NAME	ENTITY	DATE
No. 1	Leeann Butschlick	Village of Shorewood	6/24/2009
No. 2	James Swenson	Village of Shorewood	6/24/2009
No. 3	Scott Bohm	Village of Shorewood	6/24/2009
No. 4 & 5	Debra Jensen	District 260 West Seeboth, Milwaukee WI, 53204	6/25/2009
No. 6	Joan B. Hawley	Superior Engineering, S75W13139 Oxford Court, Muskego, WI 53150	6/24/2009