Addressing NPDES Permit CMOM Requirements

Marcia A. McCutchan, P.E., BCEE
Executive Vice President
RHMG, Engineers, Inc.
Sanitary Sewer Overflows

- Estimated 23,000 to 75,000 SSO events each year in the United States
- Discharge of 3 to 10 billion gallons per year of untreated sewage
- Does not include backups into buildings

Source: USEPA
Causes of SSO Events

- Blockages: 48%
- Wet Weather Infiltration and Inflow: 26%
- Mechanical or Power Failures: 11%
- Line Breaks: 10%
- Miscellaneous: 5%

Source: USEPA
Reported Causes of Blockage Events

- Grease, 47%
- Roots, 22%
- Grit, Rock, and Other Debris, 27%
- Roots and Grease, 4%

Source: USEPA
## SSO Event Volume by Cause

<table>
<thead>
<tr>
<th>Cause</th>
<th>Average SSO Event Volume (gallons)</th>
<th>Median SSO Event Volume (gallons)</th>
<th>Total Volume (million gallons)</th>
<th>Percent of Total Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blockages</td>
<td>5,900</td>
<td>500</td>
<td>69</td>
<td>3</td>
</tr>
<tr>
<td>Wet Weather I/I</td>
<td>360,000</td>
<td>14,400</td>
<td>1,860</td>
<td>74</td>
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<tr>
<td>Mechanical or Power Failures</td>
<td>63,000</td>
<td>2,000</td>
<td>157</td>
<td>6</td>
</tr>
<tr>
<td>Line Breaks</td>
<td>172,000</td>
<td>1,500</td>
<td>239</td>
<td>9</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>260,000</td>
<td>1,200</td>
<td>199</td>
<td>8</td>
</tr>
</tbody>
</table>

Source: USEPA
Proposed rulemaking concerning SSOs and CMOM programs has been a matter of public discussion since 2001

Current information can be found at:
http://cfpub.epa.gov/npdes/home.cfm?program_id=4

CMOM program currently implemented under existing State and Federal legislation
“It is hereby declared that it is the public policy of the State of Illinois that there should be no discharges of oil or other pollutants into or upon any waters which are or may be used for the purposes of providing a water supply for any city, town or village, or for purposes of recreation or navigation and that those persons responsible for such discharges shall bear the costs of removal.”
“306.102. a) Malfunctions: All treatment works and associated facilities shall be so constructed and operated as to minimize violations of applicable standards during such contingencies as flooding, adverse weather, power failure, equipment failure, or maintenance, through such measures as multiple units, holding tanks, duplicate power sources, or such other measures as may be appropriate.”
“Excess infiltration into sewers shall be eliminated, and the maximum practicable flow shall be conveyed to treatment facilities.”
Title 35: Environmental Protection Subtitle C: Water Pollution, Chapter I: Pollution Control Board

Section 306.304 Overflows

“Overflows from sanitary sewers are expressly prohibited.”
Section 392.203. “The Agency may place sanitary sewers and lift stations on Restricted Status in order to prevent overflows as expressly prohibited 35 Ill. Adm. Code 306.103(b). Restricted Status may be imposed upon the confirmation of overflows in the form of basement backups, overflows of sanitary sewer manholes, or sanitary sewer overflow devices.”
Federal Legislation

Title 40 – Protection of Environmental (40 CFR 122.41)
Chapter I--Environmental Protection Agency, Part 122—EPA Administered Permit Programs: The National Pollutant Discharge Elimination System, Section 122.41 d) and e)

(d) Duty to mitigate. The permittee shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

(e) Proper operation and maintenance. The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit.
“SPECIAL CONDITION. The Permittee shall work towards the goal of achieving no discharges from sanitary sewer overflows or basement backups and ensuring that overflows or backups, when they do occur, do not cause or contribute to the violations of applicable standards or cause impairment in any adjacent receiving water. In order to accomplish these goals, the Permittee shall develop and submit to the IEPA three copies of the Capacity, Management, Operations, and Maintenance (CMOM) plan within twelve (12) months of the effective date of this Permit. The Permittee may be required to construct additional sewage transport and/or treatment facilities in future permits or other enforceable documents.”
What is CMOM?

- Capacity
- Management
- Operations
- Maintenance
Why CMOM?

Intended to help municipalities:

- Better manage operate, and maintain collection system
- Investigate capacity constrained areas of the collection system
- Respond to sanitary sewer overflow events
Who is affected?

IEPA currently includes CMOM requirements in NPDES permits for systems with excess flow facilities or a history of sanitary sewer overflows or basement backups.

IEPA encourages satellite communities to participate, but they are not currently required to do so.
CMOM Program Elements (USEPA)

- Designing and Constructing for O&M
- System Inventory
- System Mapping
- Personnel Training
- CMOM Plan
- System Condition Assessment
- Information Management
- Repairs, Replacement, Rehabilitation
- Planning and Scheduling Work
Typical NPDES CMOM Permit Requirements

“The CMOM plan shall include the following elements:

A. Measures and Activities:
   1. A complete map of the collection system owned and operated by the Permittee;
   2. Schedules, checklists, and mechanisms to ensure that preventative maintenance is performed on equipment owned and operated by the Permittee;
   3. An assessment of the capacity of the collection and treatment system owned and operated by the Permittee at critical junctions and immediately upstream of locations where overflows and backups occur or are likely to occur; and
   4. Identification and prioritization of structural deficiencies in the system owned and operated by the Permittee.“
Typical NPDES CMOM Permit Requirements (Continued)

“B. Design and Performance Provisions:
1. Monitor the effectiveness of CMOM;
2. Upgrade the elements of the CMOM plan as necessary; and,
3. Maintain summary of CMOM activities.

C. Overflow Response Plan:
1. Know where overflows within the facilities owned and operated by the Permittee occur; and,
2. Respond to each overflow to determine additional actions such as clean up; and
3. Locations where basement back-ups and/or sanitary sewer overflows occur shall be evaluated as soon as set forth in the System Evaluation Plan.

D. System Evaluation Plan

E. Reporting and Monitoring Requirements”
“F. Third Party Notice Plan:
1. Describes how, under various overflow scenarios, the public, as well as other entities, would be notified of overflows within the Permittee’s system that may endanger public health, safety or welfare;
2. Identifies overflows within the Permittee’s system that would be reported, giving consideration to various types of events including events with potential widespread impacts;
3. Identifies who should receive the notification;
4. Identifies the specific information that would be reported including action that will be taken to respond to the overflow;
5. Includes a description of the lines of communication; and
6. Includes the identifies and contact information of responsible POTW officials and local, county, and or state level officials.”
NORTHWEST Sewer System

Northwest Facilities Planning Area & Service Communities

- Fox Lake
- Lake Villa
- Hainesville
- Round Lake
- Round Lake Beach
- Round Lake Heights
- Round Lake Park
- Lakes Region Sanitary District
- Lake County
- Utilities, Inc

Lake County

Northwest Lake Facilities Planning Area
NORTHWEST REGIONAL FACILITIES

- Water Reclamation Facility owned by Fox Lake
- Ten Miles of Interceptor Sewers and Forcemains owned by Lake County
- Three Major Pump Stations owned by Lake County
- Round Lake Sanitary District Excess Flow Facility
- Numerous Miles of local sewers and smaller pump stations owned by the 7 Communities
Northwest Lake County Sewer System Advisory Committee

- Harbor Ridge Utilities Inc.
- Lakes Region Sanitary District
- Round Lake Sanitary District
- Village of Hainesville
- Village of Round Lake
- Village of Round Lake Heights
- Lake County Public Works
- Northwest Region WRF
- Village of Fox Lake
- Village of Lake Villa
- Village of Round Lake Beach
- Village of Round Lake Park
Northwest Lake County Sewer System Advisory Committee Goals

- Develop technical recommendations, that if implemented will mitigate existing and future sanitary sewer failures such as:
  - Sanitary sewer backups
  - Sanitary sewer overflows
  - Loss of sewage treatment efficiency at the Northwest Regional Water Reclamation Facility

- Incorporate recommendations into a regional program for use by NWLCSSA members
Unique Considerations for Systems with Multiple Satellite Communities

Cooperative arrangements to develop CMOM programs which have
- Common goals for overall program
- Prudent O&M of systems, taking into account different system ages
- Equal work efforts (e.g. percent of system televised each year) and equal level of responsibility among participants
- Ease of information transfer among participants
- Enforcement processes and penalties

Benefits
- Cost sharing for program development
- Cost sharing for on-going program activities
Section 1 - Introduction

- Background Information
- CMOM Program Goals
- Definitions
- Regulatory Requirements
- IEPA Contacts
Section 2 - Management Plan Elements

- Organization
- Management of Assets
- Customer Service
- Program Authority
- Fiscal Responsibility
- Data Management
- Standard Design, Construction, and Inspection
- Safety Training
- Performance Measurements
Organization

Who is responsible for what tasks in your community?

Who can you call in affiliated communities?
Management of Assets

**O&M Tracking**

<table>
<thead>
<tr>
<th>Maintenance items</th>
<th>Daily</th>
<th>Weekly</th>
<th>Monthly</th>
<th>6 months</th>
<th>Yearly</th>
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<tbody>
<tr>
<td>Inspection</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Check coolant heater</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Check coolant level</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Check oil level</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Check fuel level</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Check charge-air piping</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Check/clean air cleaner</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Check battery charger</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drain fuel filter</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drain water from fuel tank</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>Check coolant concentration</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Check drive belt tension</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drain exhaust condensate</td>
<td>X</td>
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<td>Check starting batteries</td>
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<td>Change oil and filter</td>
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<td>Change coolant filter</td>
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<td>Clean crankcase breather</td>
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<tr>
<td>Change air cleaner element</td>
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<td>Check radiator hoses</td>
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<tr>
<td>Change fuel filters</td>
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<td></td>
</tr>
<tr>
<td>Clean cooling systems</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

**Sewer System Maps**

**Condition Assessment Program**

**Equipment and Spare Parts**
Management of Assets (Continued): Identify Critical Structures and Components

- **Lift Stations / Forcemains**
  - Capacity
  - Number of connections
  - Time before SSOs or basement overflows
  - Proximity to sensitive areas
  - Emergency power availability

- **Sewers**
  - Number of connections
  - Time before SSOs or basement overflows
  - Proximity to sensitive areas
Customer Service

- Handling of complaints and emergencies
- Documentation and tracking of problems
- Information “succession plans”
Can you legally do what you need to accomplish?
Are regulations, standards, and ordinances up-to-date?
Are requirements the same for all satellite communities?
Are operation and maintenance activities adequately funded?

Sewer Use Ordinance
Maintenance of Sewer Laterals
Infiltration and Inflow Control
Illegal Connections and Discharges
Fats Oil and Grease Elimination Program
Industrial Pretreatment Program
Standards of Design, Construction, and Inspection
User Charge Ordinance
Safety Training

DANGER
USE LOCKOUT BEFORE WORKING ON EQUIPMENT

OSHA® Training Institute Education Centers
Performance Tracking

- Are programs in place to verify that you accomplish what you set out to do?

> **Collect data and track performance**
> **Detect performance issues**
> **Diagnose issues and identify solutions**
> **Fix issues & verify results**
Section 3 - Operation and Maintenance Plan

“The future depends on what we do in the present.”

- Mahatma Gandhi
Operation and Maintenance Plan
NWLSSAC Goals

- 100% of sewers to be televised within 10 years, with a minimum of 10% of sewers inspected per year on a cumulative basis.
- 100% of manholes to be inspected within 10 years, with a minimum of 10% of manholes inspected on a cumulative basis.
- All pumping facilities to be inspected weekly at a minimum, all wet wells to be cleaned annually, annual in-depth inspection required.
Operation and Maintenance Plan
NWLSSAC Goals (continued)

- All critical structures to be inspected monthly and during significant wet weather events.
- Air relief valves to be inspected monthly.
- 100% of sewers to be cleaned within 10 years with a minimum of 10% cleaned per year on a cumulative basis. Critical areas to be cleaned more frequently.
- All grease traps to be inspected annually. Suspect traps to be inspected more frequently.
- Root removal to be done on an as-needed basis.
System repairs to address major deficiencies (structural problems, major root intrusion, major I/I) to be performed at earliest opportunity

Other repairs to be prioritized with the goal to be completed within 2 years

All critical structure defects, grease trap defects, and air relief valve defects to be repaired as soon as possible
Section 4 - Capacity Plan

How do you identify and address any bottlenecks in your system?
Capacity Assurance Check List

- Up-to-date sewer system map
- Current Facility Plan
- Up-to-date number of service connections
- Current system flow rates (dry and wet weather) – pump station records
- Pump station capacities
- Program to monitor bottlenecks, capacity constriction areas, problem areas
- Infiltration / inflow analysis
- Sewer system evaluation survey
- Flow monitoring program
NWLSSAC Capacity Plan

- No dry weather flow restrictions
- Review flows during wet weather events
- Identify critical structures
- On-going inspection program
- Ordinance enforcement
NWLSSAC Field Investigation Requirements

- Perform regular field investigations
- Investigate, document, and report problem areas, backups, and overflows
- Incorporate observations from field investigations into repair recommendations
NWLSSAC Flow Monitoring Plan

- Visual monitoring during dry and wet weather conditions
- Flow meter readings or pump run times documented under dry and wet weather conditions and compared against historical data to evaluate system flows and capacity
- New pumping stations with design capacities of 1,200 gpm or more to be equipped with flow meters
- Observations of significant increases in dry or wet weather flows to result in investigation of service area (sewer televising, dye testing, smoke testing, flow monitoring with flow metering equipment)
- Dry and wet weather flow monitoring to be performed in areas of high I&I
Member utilities must make system repairs to reduce public system sources of I&I

Member utilities must have ordinance which requires property owners to maintain service connections and prohibits clean water sources to the sanitary sewer

Member utilities to encourage customers to disconnect downspouts, sump pumps, footing drains, and area drains from the sanitary sewer
Section 5 – Response Plan for SSOs and Emergencies
<table>
<thead>
<tr>
<th>Elements of SSO Response Plans</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identify known or potential overflow sites</td>
</tr>
<tr>
<td>Develop / document procedure for receipt of notification of SSO events</td>
</tr>
<tr>
<td>Develop / document procedure for notification/communication of SSO events</td>
</tr>
<tr>
<td>Third Party Notice Plan</td>
</tr>
<tr>
<td>Procedure for Responders</td>
</tr>
<tr>
<td>Investigation procedures for determine cause of events</td>
</tr>
<tr>
<td>Documentation of maintenance procedures for individual incidents</td>
</tr>
<tr>
<td>Documented training for field personnel, including first responders, covering procedures and methods to respond to SSOs</td>
</tr>
<tr>
<td>IEPA Sanitary Sewer Overflow or Bypass Notification Summary Report</td>
</tr>
</tbody>
</table>
SSO Call Receipt Procedures

- Time and date call was received
- Callers name and phone number
- Location of problem
- Description of problem and observation
- Any other information that may help responders
SSO Notification Procedures

- Responders
- Emergency management officials
- Municipal officials
- Regulatory agencies
- Affected customers / public
Third Party Notice Plan

- Describes how, under various overflow scenarios, the public and others would be notified of overflows that endanger health
- Identifies what overflows will be reported
- Identifies who will receive notification
- Identifies the specific information to be reported
- Includes a description of lines of communication
- Includes identities of responsible officials
Procedure for Responders

- Required personnel (in-house staff and subcontractors)
- Required equipment
- Probable response activities and methods
- Response time standards
- Persons/agencies to be notified of the SSO
- Post response reporting
  - Reasons for the SSO
  - Necessary actions to prevent same or similar occurrence from happening in the future
Elements of Major Emergency Response Plan

- List of critical customers (hospitals, schools, municipal facilities, fire stations, police stations, nursing homes)
- Procedure for notification / communication of emergencies
- List and location of critical system components
- Potential threats and response procedures (man-made, accidental, natural threats)
- Preventative measures (access control, barriers, backflow preventers, testing and maintenance)
- Emergency contact information directory
Section 6 – Condition Assessment Program

Assess → Identify Need → Prioritize → Plan → Budget → Repair/Replace
You’ve developed your CMOM Plan.....
Section 7 – Communication Plan

- Board meetings
- Websites
- Newsletters
- Utility bill mailings
- Reverse 911

“EACH OF YOU HAS BEEN GIVEN A SIMPLE, YET POWERFUL TOOL...”
Section 8 - Annual CMOM Review and Audit

- CMOM plan performance evaluation and monitoring
- Provide recommendations for infrastructure and plan improvements
- Update the CMOM plan
- Annual summary report
- Presentations to community officials
Additional Accountability and Enforcement Audit for Systems with Satellite Communities

- Annual review by Advisory Committee to confirm all communities are making progress toward CMOM objectives
- Local surcharge fees assessed to any community failing to fulfill CMOM objectives, as determined by a consensus of the committee
- Surcharges fee used to fund improvements within the deficient community sewer collection system or to regional improvements
Every member has adopted the CMOM Plan
Test year (2013) reports submitted by members
First required reporting (2014) due April 30, 2015
CMOM Sub-Committee Meeting July, 2015
  Review activities by all members
  Implement enforcement procedures if needed
  Adjust CMOM program based upon last year's experience
NWLSSAC 2013 Test Year Results

- 12 NWLSSAC Member Communities
- 30,300 service connections
- 1,350,000 lf of sanitary sewer
- 5,600 manholes
- 170,000 lf forcemains
- 92 pumping stations
- 30 Sanitary Sewer Overflows
- 12 Basement Backups
NWLSSAC 2013 Inspection Results

- 424,000 lf (31%) gravity sewer cleaned
- 27,000 lf (16%) of forcemain cleaned
- 4,100 feet of root control and removal completed
- 109,000 lf (8%) of gravity sewer televised
- 2,490 (45%) manholes inspected
- 100% of lift stations inspected
NWLSSAC 2013 Repair Summary

- 64 manholes repaired
- 15 manholes replaced
- 11 sewer spot repairs
- 6,574 lf of sewer lining
- 24 pump station repairs
- 7 pumps replaced
Questions?

Marcia A. McCutchan, P.E., BCEE
Executive Vice President
RHMG, Engineers, Inc.
mmccutchan@rhmg.com
(847)362-5959